Chapter 9

Threatened and Endangered Species

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CHAPTER 9

9-1.0 Introduction—Threatened and Endangered Species

9-1.1 Purpose

This chapter provides information about the use of the project area by federal- and state-listed species (endangered and threatened species, candidate species, species of concern, and sensitive species), and assesses impacts on listed species resulting from the implementation of each alternative.

Qualitative and quantitative information from existing literature and from field surveys of the proposed project features is presented to explain historic, recent, and existing conditions in the project area. Species-specific studies were identified during the EIS scoping process, and the results of these studies are evaluated and discussed. Conditions that would occur if the project is implemented are evaluated and assessed to determine impacts. If necessary, conservation measures are developed to a conceptual level and discussed.

9-1.2 Objectives

The objectives of this chapter are to present the findings of studies and data analysis as follows:

- Conduct a literature search to determine potential endangered and threatened species, candidate species, species of concern, and sensitive species presence, abundance, and habitat requirements in the project area.
- Conduct surveys for endangered and threatened species, candidate species, species of concern, and sensitive species in the project area.
- Describe potential impacts to endangered and threatened species, candidate species, species of concern, and sensitive species resulting from the implementation of the project.
- Discuss conservation measures proposed by EPWU/PSB to reduce or eliminate significant impacts to endangered and threatened species, candidate species, species of concern, and sensitive species as a result of implementation of the project.

9-2.0 Methodology

9-2.1 Assumptions and Assessment Guidelines

Biologists performed listed species surveys and assessed impacts that would result from implementation of the alternatives. The following assumptions were made during the survey and assessment:

- Specific surveys were not required for species other than those listed as endangered or threatened by the U.S. Fish and Wildlife Service (FWS) or sensitive by the U.S. Bureau of Land Management (BLM) on BLM lands.
- Reconnaissance-level vegetation surveys were sufficient to determine the suitability of habitat for each listed species and the potential occurrence of the species at inaccessible, privately owned sites.

9-2.2 Significance Criteria

The key federal law that protects listed species and their habitat is the Endangered Species Act (ESA) of 1973 (Public Law [P.L.] 93-205) and amendments of 1988 (P.L. 100-478). If the project results in the "take" of a listed species then the action would have significant adverse impacts to the listed species. Under the ESA, the FWS can designate areas as "critical habitat" for listed threatened or endangered species. If the project results in removal or degradation of the vegetation community within designated critical habitat, then the project would have significant impacts on the listed species.

9-2.3 Literature Studies

Before conducting field studies, biologists contacted the appropriate federal and state agencies to obtain information on listed species that potentially occur in the project counties. A literature search was then conducted to determine habitat requirements for each listed species, as shown in Table 9-2.1 through Table 9-2.7. Vegetation community maps of the project area were compared to the habitat requirements of each listed species to determine potential occurrence in the project area (Tables 9-2.1 through 9-2.7). Habitat requirements of the listed species were then compared to aquatic and terrestrial vegetation communities at a project feature (Table 9-2.8) to determine the potential for occurrence of listed species at the site. If suitable habitat was present, a literature search was completed to determine if existing site-specific or regional data on the species were available.

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TABLE 9-2.8
Project Features: Aquatic and Terrestrial Plant Communities

Project Features	Community											
	AQ	**RS**	**AG**	**CS**	**MS**	**GR**	**TA**	**TS**	**MD**	**CP**	**HS**	**BG**
Reservoirs	X	--	--	--	--	--	--	--	--	--	--	--
River Corridor	X	--	--	--	--	X	X	X	--	--	--	--
Treatment Plants												
Hatch		--	X	--	--	--	--	--	--	--	--	--
Las Cruces I-10	--	--	X	--	X	--	X	--	--	--	--	--
Leasburg	--	--	--	X	X	--	--	--	--	--	--	--
Anthony	--	--	X	--	--	--	--	--	--	--	--	--
Upper Valley	--	--	X		--	--	--	--	--	--	--	--
Jonathan Rogers	--	--	--	--	--	X	--	--	--	--	--	--
Water Reservoirs												
Westside	--	--	--	--	--	--	X	--	--	--	--	--
Socorro	--	--	--	--	--	--	X	--	--	--	--	X
Bosque	--	--	--	--	X	--	--	--	--	--	--	X
Aqueducts												
El Paso	--	--	X	X	X	X	X				X	
New Mex./Texas	--	--	X	--	--	X	--	--	--	--	--	X
Well Sites (ASR)	--	--	--	X	--	--	--	--	X	--	--	--

AQ =Aquatic
RS =Riparian Shrubland
AG =Agricultural Field
CS =Creosote Scrub
MS =Mesquite Scrub
GR =Grassland
TA =Tamarisk
TS =Tamarisk Scrub
MD =Mesquite Dunes
CP =Creosote/Prickly Pear Shrub
HS =Highway Scrub
BG =Bare Ground

9-2.4 Survey Species and Methodologies

With the exception of the reservoirs and sites that were inaccessible because of private ownership, species-specific surveys were conducted for federally listed endangered and threatened and BLM sensitive plants and animals, which based on habitat requirements, had a moderate to high potential of occurring at a project feature. Current regional occurrence and abundance data for the species and/or reconnaissance-level surveys were used to characterize inaccessible project features; for example, a 10-acre site for a treatment plant somewhere within a 100-acre general site. Reconnaissance-level surveys were completed for all remaining listed species. The locations of observed listed species were recorded on USGS topographic maps or the Universal Transverse Mercator (UTM) coordinate was determined

using a Rockwell GPS. Plant and animal locations were then copied onto digital USGS topographic maps.

9-2.4.1 Plants

Nineteen federally listed (FWS) endangered, threatened, and sensitive (BLM) species and species of concern (FWS) and 37 state-listed plant species potentially occur in the project area (Table 9-2.1). The potential of occurrence for most federally listed plant species ranged from no possibility of occurrence to a low potential of occurrence at most project features (Table 9-2.9). Project features with suitable habitat for listed plant species were the reservoirs, river corridor, El Paso Aqueduct corridor, and the Westside Regulating Reservoir. The only project feature with potentially occurring endangered and threatened plant species was the proposed El Paso Aqueduct corridor.

Species-specific surveys were conducted along the El Paso Aqueduct corridor for FWS endangered and threatened and BLM sensitive plant species. Survey species included Guadalupe rabbitbrush, gyp ringstem, Alamo penstemon, Sneed's pincushion cactus, Roetter's hedgehog cactus, Duncan's pinchcushion cactus, fish-hook barrel cactus, southwestern barrel cactus, sand prickly pear, night-blooming cerius, and grama grass cactus.

Survey dates were determined by developing a flowering and fruiting chronology for the survey species (Table 9-2.10). Prior to conducting the surveys, the two biologists visited the herbarium at the University of Texas, El Paso, to examine pressed specimens of the survey species. Surveys were conducted from June 2 through 6, 1999, and from August 10 through 15, 1999. The two biologists divided the 27-mile-long by 100-foot-wide aqueduct corridor into two, 27-mile-long by 50-foot-wide strip transects. Each biologist walked one of the 27-mile long strip transects, recording in a field notebook all listed plant and animal species observed during the survey.

9-2.4.2 Insects

One of two federally listed insect species, the Anthony blister beetle, potentially occurs in the project area (see Table 9-2.2). The species could occur at project features such as the Anthony Treatment Plant or the New Mexico–Texas and El Paso Aqueducts near Anthony, New Mexico.

The historic range of Anthony blister beetle includes areas of New Mexico and Mexico. The FWS is not aware of any sightings of this beetle within New Mexico borders since 1963 (Fed. Register 1994). No specific surveys were conducted for this species.

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TABLE 9-2.10
Flowering and Fruiting Times for Federal/State Endangered, Threatened, Candidate, Rare, and Species of Concern Potentially Occurring at the Project Features in Sierra and Doña Ana Counties, New Mexico. and El Paso County, Texas

Plant Species	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
Texas false saltgrass					X	X	X	X
great sedge								
resin-leaf bricklebrush						X	X	X
Castetter's milkvetch		X	X					
Wheeler's spurge	No information available							
dense cory cactus			X	X	X			
Duncan's pincushion cactus			X	X	✸	✸	✸	
catchfly gentian				X	X	X	X	X
prairie gentian				X	X	X	X	
sand sacahuista			X	X				
sand prickly pear[1]			X	X	✸	✸		
Wooton's prickly pear			X	X	✸	✸		
night-blooming cerius				X	X			
Scheer's pincushion cactus[2]	?	?	?	?	?	?	?	?
Sneed pincushion cactus				✸	✸	✸	✸	✸
		X	X	X	X	X	X	
Roethers hedgehog cactus		X	X	X	✸	✸		
Wright's globemallow	X	X	X	X	X	X	X	X
long-stemmed flame flower				X	X	X	X	

[1]=Flowers in November
[2]=Flowering period unknown (Correll and Johnston 1979)
✸=Fruiting period
X=Flowering period
NA=Not applicable
Sources: Brown 1982; Correll and Johnston 1979; Weniger 1984; Szaro 1989; Epple 1995; Ivey 1995; Sivinski and Lightfoot 1995;TPWD 1997; BLM 1998; FWS 1998.

9-2.4.3 Molluscs

Five species of molluscs were listed as potentially occurring species in the project area. Land snails listed for the project area have restricted distributions because of specific habitat requirements. Based on available information, suitable habitat for listed molluscs is not present at the project features (see Table 9-2.3). Surveys were not conducted for these listed molluscs.

9-2.4.4 Amphibians and Reptiles

Nine species of amphibians and reptiles were listed as potentially occurring species in the project area (see Table 9-2.4). Six species could occur at the project features (Tables 9-2.11 and 9-2.12). Species-specific surveys were not conducted for listed amphibians or reptiles because the species are not federally listed as endangered/threatened or sensitive by the BLM. Surveys were limited to generic qualitative sampling of habitat types along portions of the river corridor. Reconnaissance–level surveys were conducted for all listed amphibian and reptile species during all biological surveys conducted for this project. Chapter 5, *Amphibians and Reptiles*, contains a description of the methods used to survey all of the project features.

9-2.4.5 Fish

Five species of fish were listed as potentially occurring species in the project area (see Table 9-2.13). Suitable habitat is present for only one of the species—the longfin dace.

Surveys for this species were conducted by the FWS.

9-2.4.6 Birds

Twenty-eight species of birds were used as potentially occurring species in the project area, (see Table 9-2.6). Potentially occurring species at each of the project features are listed in Table 9-2.14. Reconnaissance level surveys were conducted for bald eagle and peregrine falcon during the winter and spring waterfowl and shorebird surveys along the Rio Grande (see Chapter 6, *Avian*). Species-specific surveys were conducted for southwestern willow flycatcher. Surveys were not specifically conducted for the remainder of the potentially occurring species. These species are fairly common migrants in the project area, such as white-faced ibis; rare spring-fall migrants, such as Costa's hummingbird; and very rare winter residents, such as northern goshawk; or accidental, such as brown pelican. Reconnaissance-level surveys were conducted for these species along the Rio Grande during the winter and spring waterfowl and shorebird surveys.

TABLE 9-2.11
Presence/Absence of Suitable Habitat for Listed Amphibian and Reptile Species at the Reservoirs, River Corridor, and Treatment Plant Project Features*

Listed Species Common Name *Scientific Name*	Status		Habitat Present by Project Feature							
	F	St	RS	RC	HA	LE	LA	AN	UV	JR
Amphibians										
northern leopard frog *Rana pipiens*		SpC	Y	Y	Y	N	Y	N	Y	Y
Chiricahua leopard frog *Rana chiricahuensis*	C, S	SpC	Y	Y	Y	N	Y	N	Y	Y
Reptiles										
Texas lyre snake *Trimorphodon biscutatus*		T	N	N	N	Y	N	N	N	N
New Mexico garter snake *Thamnophis sirtalis dorsalis*		SpC	Y	Y	Y	N	Y	N	Y	Y
Big Bend slider *Trachemys gaigeae*		SpC	Y	Y	Y	N	Y	N	Y	N
Texas horned lizard *Phyrnosoma cornutum*	SpC, S	T	Y	Y	Y		Y	Y	Y	Y

*Note: Only species that occur in the project area and with suitable habitat in the project area are included.

Legend:

F = Federal
St = State
RS = Reservoirs
RC = River Corridor
HA = Hatch
LE = Leasburg
LA = Las Cruces
AN = Anthony
UV = Upper Valley
JR = Jonathan Rogers
T = Threatened
SpC = Species of Concern
S = Sensitive (BLM)
Y = Yes (suitable habitat)
N = No (Non-suitable habitat)

TABLE 9-2.12
Presence/Absence of Suitable Habitat for Listed Amphibian and Reptile Species at Water Reservoir, Aqueduct, and Well Site Project Features

Listed Species Common Name *Scientific Name*	Status		Project Feature			
	F	St	WR	EP	NT	WS
Amphibians						
Arizona toad *Bufo microscaphus microscaphus*	SpC, S	SpC	N	N	N	N
northern leopard frog *Rana pipiens*		SpC	Y	N	Y	N
Chiricahua leopard frog *Rana chiricahuensis*	C, S	SpC	Y	N	Y	N
Reptiles						
Texas lyre snake *Trimorphodon biscutatus*		T	N	Y	N	N
New Mexico garter snake *Thamnophis sirtalis dorsalis*		SpC	Y	N	N	N
Big Bend slider *Trachemys gaigeae*		SpC	Y	N	N	N
Texas horned lizard *Phyrnosoma cornutum*	SpC, S	T	Y	Y	Y	Y

Legend:
F = Federal
St = State
WR = Water Regulating Reservoir
EP = El Paso Aqueduct
NT = New Mexico–Texas Aqueduct
WS = ASR/Well Sites
T = Threatened
SpC = Species of Concern
S = Sensitive (BLM)
N = No (Non-suitable habitat)
Y = Yes (suitable habitat)

TABLE 9-2.13
Presence or Absence of Suitable Habitat for Listed Fish at Aquatic Project Features

Common Name *Scientific Name*	Federal		State				
	FWS	**BLM**	**NM**	**TX**	**RES**	**RG**	**DR**
gila trout *Oncorhynchus gilae*	E	T			N	N	N
bluntnose shiner *Notropis simus*				T	N	UNK	UNK
longfin dace *Agosia chryogaster*	SpC	S			N	Y	N
Rio Grande cutthroat trout *Onchorhynchus clarki virginalis*			SpC		N	N	N
Rio Grande chub *Gila pandora*			SpC	T	N	UNK	N

FWS = U.S. Fish and Wildlife Service
BLM = Bureau of Land Management
NM = New Mexico Department of Game and Fish
TX = Texas Parks and Wildlife Department
RES = Reservoirs
RG = Rio Grande
DR = Drains

E = Endangered
S = Sensitive (BLM)
SpC = Species of Concern
T = Threatened
Y = Yes
N = No
UNK = Unknown

Sources: Lee et al 1980; Paige and Burr 1991; TPWD 1997; NMDGF 1998; BLM 1998; FWS 1998.

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9-2.4.7 Mammals

Twenty-five species of mammals were listed as potentially occurring species in the project area (see Table 9-2.7). Three federally listed endangered mammals potentially occur at the project features (see Table 9-2.15). The black-footed ferret and gray wolf are considered extirpated in the project area by most natural heritage agencies. The Mexican gray wolf has been introduced into portions of southeastern Arizona and southwestern New Mexico. Therefore, no specific surveys are needed for these species. A wide variety of sensitive mammals (primarily bats) occur in the El Paso Aqueduct corridor on land previously managed by the BLM. As a result, only reconnaissance level surveys were conducted. All other listed mammals are considered federal species of concern, state threatened species, or state species of concern. These species were recorded when observed during project surveys conducted for listed species, vegetation mapping, wetland delineation, waterfowl and shorebird, and mammal track/scat.

9-2.4.2 Quality Assurance/Quality Control

Quality assurance (QA) and quality control (QC) measures were completed during listed species-specific surveys to provide the most accurate survey possible. The field survey crew worked in a team of two people. Within the team, one member verified the identifications of protected species made by the other. If discrepancies existed, a plant taxonomist was consulted.

Two sites were surveyed twice to ensure that findings were consistent. Any discrepancies between the two surveys were noted and then checked by the technical field manager.

9-2.5 Data Analysis

Other than the number of each listed species observed and the locations of the listed species, data were not collected during surveys. For this reason, no data analysis was necessary.

TABLE 9-2.15
Mammal Distribution and Presence or Absence of Suitable Habitat for Federal/State Endangered, Threatened, Candidate, Rare, and Species of Concern Potentially Occurring in Project Area

Common Name *Scientific Name*	Federal		State		Within Known Distribution	Habitat Present
	USFWS	BLM	NM	TX		
western small-footed myotis bat *Myotis ciliolabrum melanorhinus*	SpC	S	SpC		Yes	Yes
Yuma myotis bat *Myotis yumanensis yumanensis*	SpC	S	SpC	SpC	Yes	Yes
ocult little brown myotis bat *Myotis lucifugus occultus*	SpC	S	SpC		Yes	Yes
long-legged myotis bat *Myotis volans interior*	SpC	S	SpC		No	NA
fringed myotis bat *Myotis thysanodes thysanodes*	SpC	S	SpC	SpC	Yes	Yes
long-eared myotis bat *Myotis evotis evotis*	SpC	S	SpC		No	NA
cave myotis bat *Myotis velifer*		S			No	NA
western red bat *Lasiurus blosevillii*			SpC		Yes	Yes
eastern red bat *Lasiurus borealis*			SpC		Yes	Yes
spotted bat *Euderma maculatum*	SpC	S	T	T	Yes	Yes
pale Townsend's big-eared bat *Plecotus townsendii pallescens*	SpC	S	SpC		Yes	Yes
big free-tailed bat *Nyctinomops macrotis*	SpC	S	SpC		No	NA
Organ Mt. Colorado chipmunk *Tamias quadrivittatus australis*	SpC	S	T		No	NA
Arizona black-tailed prairie dog *Cynomys ludovicianus*		S		SpC	Yes	Yes
Gunnison's prairie dog *Cynomys gunnisoni*			SpC		No	NA
rock pocket mouse *Chaetodipus intermedius rupestris*			SpC		Yes	Yes
desert pocket gopher *Geomys arenarius arenarius*	SpC	S		SpC	Yes	Yes
desert pocket gopher *Geomys arenarius brevirostris*	SpC			SpC	Yes	Yes
Botta's pocket gopher *Thomomys bottae opulentus*			SpC		Yes	Yes
Mearn's pocket gopher *Thomomys bottae mearnsi*		S			ND	NA
Pecos River muskrat *Ondatra zibethicus ripensis*	SpC	S	SpC	SpC	ND	Yes

TABLE 9-2.15
Mammal Distribution and Presence or Absence of Suitable Habitat for Federal/State Endangered, Threatened, Candidate, Rare, and Species of Concern Potentially Occurring in Project Area

Common Name *Scientific Name*	Federal		State		Within Known Distribution	Habitat Present
	USFWS	BLM	NM	TX		
red fox *Vulpes vulpes*			SpC		No	NA
ringtail *Bassariscus astutus*			SpC		No	NA
black-footed ferret *Mustela nigripes*	E			E	No	NA
western spotted skunk *Spilogale gracilis*			SpC		No	NA
common hog-nosed skunk *Conepatus mesoleucus*			SpC		No	NA
gray wolf *Canis lupus*	E		Ex	E	Yes [1]	Unknown
Mexican gray wolf *Canis lupus baileyi*	E			E	No	NA
desert bighorn sheep *Ovis canadensis mexicana* (endangered pops)			E		No	NA

[1]-Historic
BLM–Bureau of Land Management
C–Candidate
E–Endangered
Ex–Extirpated
USFWS–U.S. Fish and Wildlife Service
NA–Not applicable
ND-No data available
NM–New Mexico Department of Game and Fish
S–Sensitive (BLM)
SpC–Species of Concern
T–Threatened
TX–Texas Parks and Wildlife Department listing
Sources: Findley et al. 1975; Hoffmeister et al. 1986; Davis and Schmidly 1994; Degenhardt et al. 1996; TPWD 1997; NMDGF 1998; BLM 1998; FWS 1998.

9-3.0 Affected Environment

9-3.1 Protected Species

As previously discussed in Section 9-2.1, specific surveys are required and were conducted only for federally listed endangered and threatened species, and for BLM-listed species on BLM land. The El Paso Aqueduct corridor is the only project feature that contains property previously and currently managed by BLM. Unless noted otherwise, reconnaissance-level surveys were conducted for all listed species during each biological survey conducted for this project.

9-3.2 Plants

Literature review consisted of an information request to the FWS; BLM; New Mexico Natural Heritage Program (NMNHP); Texas Parks and Wildlife Department (TPWD); New Mexico Department of Game and Fish (NMDGF); and the Mexico Energy, Minerals, and Natural Resources Conservation Division. Any additional information that could be located was also used, including the World Wildlife Fund (1990, 1991, 1992, 1994). Locality information contained in agency lists provides information about whether a specific species could potentially occur in a county. Very little specific information was found concerning known locations of listed plants in the project area. The most detailed information found was in a database maintained by the NMNHP. This database identified USGS topographic quadrangle coverage for areas where listed plant species had been observed. Coordinates for observations were not given. Therefore, a species may have been observed within the coverage area of a USGS quadrangle map that also covers the project area, without the plant actually occurring within the project area. The NMNHP disclaimer states that the records should not be regarded as a final statement on the elements being considered, nor should they be substituted for onsite surveys required for environmental assessments.

9-3.2.1 Reservoirs

9-3.2.1.1 Literature Review

The U.S. Bureau of Reclamation (USBR) evaluated potential presence of federal or state-listed endangered and threatened plant species in the Elephant Butte and Caballo Reservoir Resource Management Plan EIS. The study area for this project (Elephant Butte/Caballo Reservoirs and the Rio Grande between the reservoirs) is primarily lowland habitats (open water of the reservoirs, shoreline and riparian communities), unlike the more upland terrestrial habitats in the USBR project area.

The USBR evaluated habitat for button cactus (*Epithilantha micromeris*), Castetter milkvetch (*Astragalus castetteri*), Duncan's cory cactus (*Coryphantha duncanii*), Fugate's amsonia (*Amsonia fugatei*), and Sanberg's pincushion cactus (*Escobaria sanbergii*). These species are not known or suspected to occur in the project area covered by the USBR's EIS

(USBR 1999). Rare and sensitive plants listed by the State of New Mexico not evaluated in the Elephant Butte and Caballo Reservoir Management Plan EIS are evaluated in this section.

Based on the habitat present, potentially occurring species along the shoreline of the reservoir are Texas false saltgrass, great sedge, resin-leaf bricklebrush, Castetter's milkvetch, catchfly gentian, prairie gentian, fish-hook barrel cactus, southwestern barrel cactus, sand prickly pear, Wooten's prickly pear, and night-blooming cereus (see Table 9-2.9). These species are not listed under the ESA.

Information was located for only one of the 11 potentially occurring listed plant species. Castetter's milkvetch was observed on BLM property on the limestone cliffs around Caballo Reservoir in 1988. The exact location of these plants was not listed. These plants were, more than likely, located above the normal pool elevation because it occurs in interior chaparral and Great Basin conifer woodlands (see Table 9-2.1).

It should be noted that a USGS quadrangle map covers an area of about 60 square miles and likely includes many plant communities and levels of human disturbance. Occurrence of a project feature within a quadrangle with a listed species record only indicates that the listed species occurs in suitable habitat in the general area of the feature.

9-3.2.1.2 Field Survey Results

Surveys were not conducted for listed species at the reservoir sites. Existing information was used to determine potential occurrence and abundance. As identified in Table 9-2.9, suitable habitat for 11 listed plant species occurs within the reservoir sites. No species listed under the ESA would be located within these project features. The quality of habitat, within the actual limits of the project area (shoreline plant communities at the reservoir), would be marginal for all of the species.

9-3.2.2 River Corridor

9-3.2.2.1 Literature Review

Potentially occurring species along the shoreline of the river corridor are Texas false saltgrass, great sedge, resin-leaf bricklebrush, Castetter's milkvetch, catchfly gentian, prairie gentian, Wright's globemallow, long-stemmed flame flower, Scheer's pincushion cactus, fish-hook barrel cactus, southwestern barrel cactus, and sand prickly pear (see Table 9-2.9). These species are not listed under the ESA.

Information was found for one of the eight listed plant species: four Scheer's pincushion cactus were observed on BLM land (open plains and sandy flats) in 1988, within the area covered by the La Union quadrangle. Numerous sand prickly pear have been observed through 1992 on BLM and private land, within the area covered by the Anthony quadrangle.

9-3.2.2.2 Field Survey Results

Field surveys for listed plants were limited to sites surveyed for vegetation mapping and wetland delineation (see Chapters 3, *Vegetation*, and 4, *Potential Jurisdictional Waters of the U.S.*). Listed plants were not located during these surveys. In general, habitat throughout most of the river corridor has been significantly disturbed by levee construction and floodplain maintenance activities. Listed species would not be expected to occur because of the dramatically altered and poor quality habitat present in the river corridor.

9-3.2.3 Water Treatment Plants

9-3.2.3.1 Literature Review

Potentially occurring species at the treatment plant and diversion/conveyance sites are Texas false saltgrass, great sedge, resin-leaf bricklebush, catchfly gentian, prairie gentian, Wright's globemallow, long-stemmed flame flower, Scheer's pincushion cactus, Duncan's pincushion cactus, fish-hook barrel cactus, southwestern barrel cactus, sand prickly pear, Wooten's prickly pear, and night-blooming cereus (see Table 9-2.9). None of these species are listed under the ESA. Information was found for one of the 14 listed plant species: four Scheer's pincushion cactus were observed on BLM land (open plains and sandy flats) in 1988, within the area covered by the La Union quadrangle, which includes the Anthony Treatment Plant. Suitable habitat for listed plants is not present within water transmission right-of-ways because the habitat is disturbed.

9-3.2.3.2 Field Survey Results

Surveys were not conducted for listed species at most of the treatment plants sites because the proposed sites were privately owned and inaccessible. Existing information and habitat quality was used to determine potential occurrence at inaccessible sites. As identified in Table 9-2.9, suitable habitat for 14 plant species occurs within the treatment plant sites. Eight southwestern barrel cactus, a BLM sensitive species, were located during surveys at the Leasburg Treatment Plant site. The presence or absence of two state-listed plants, Wright's globemallow and long-stemmed flame flower, could not be determined at the Leasburg WTP site, because surveys were conducted in November when these species are not detectable (Leasburg was added as a project feature in late October 1999). Listed plant species were not found during the survey of the Upper Valley site. The quality of habitat was poor within the boundary of the remaining treatment plant sites; no listed plant species would be expected to occur.

9-3.2.4 Westside Regulating Water Reservoir

9-3.2.4.1 Literature Review

Species potentially occurring in the proposed holding/regulating water reservoirs are: Texas false saltgrass, Wheeler's spurge, Wright's globemallow, long-stemmed flame flower, Scheer's pincusion cactus, Roetter's hedgehog cactus, Duncan's pincushion cactus, fish-hook

barrel cactus, southwestern barrel cactus, sand prickly pear, Wooten's prickly pear, and night-blooming cereus (see Table 9-2.9). None of these species are listed under the ESA. No information was obtained regarding observations of listed species in the vicinity of the proposed site for the Westside Regulating Reservoir.

9-3.2.4.2 Field Survey Results

The survey was limited to vegetation mapping and/or wetland delineation at each of the sites. Existing information was used to determine potential occurrence for those portions of the site that were not surveyed. Moderate quality habitat for 12 listed plant species occurs at the Westside Regulating Reservoir site (see Table 9-2.9).

9-3.2.5 Aqueducts

9-3.2.5.1 El Paso Aqueduct

9-3.2.5.1.1 Literature Review. Species potentially occurring in the El Paso Aqueduct right-of-way (ROW) are Texas false saltgrass, great sedge, resin-leaf bricklebrush, Wright's globemallow, long-stemmed flame flower, Scheer's pincushion cactus, Sneed pincushion cactus, Roetter's hedgehog cactus, Duncan's pincusion cactus, southwestern barrel cactus, sand prickly pear, Wooten's prickly pear, and night-blooming cereus (see Table 9-2.9). The only species listed under the ESA is Sneed pincushion cactus.

Information was located for two of the 13 listed plant species. Numerous sand prickly pear have been observed through 1992 on BLM and private land within the area covered by the Anthony quadrangle map. Four night blooming cereus were observed in 1988 on alluvial soils on sides of arroyos on BLM land covered by the Newman quadrangle. In addition, Dr. Richard Worthington, an associate professor of biological sciences for the University of Texas at El Paso (UTEP), was contacted for information concerning the Anthony Gap area. Dr. Worthington is the UTEP herbarium curator. Dr. Worthington advised that, based on his knowledge of the area, none of the listed species would occur in the Anthony Gap portion of the El Paso Aqueduct project feature.

9-3.2.5.1.2 Field Survey Results. Field surveys conducted along the El Paso Aqueduct corridor located two listed plant species. Approximately 50 small clumps of sand prickly pear and three southwestern barrel cactus were observed within the aqueduct corridor. The exact location of these plants was recorded using a Global Positioning System (GPS); however, the coordinates are not included in this report to prevent unauthorized collection. Overall, habitat quality for most of these species is low because of the highly disturbed condition of the majority of the corridor.

9-3.2.5.2 New Mexico–Texas Aqueduct

9-3.2.5.2.1 Literature Review. Species potentially occurring within the New Mexico–Texas Aqueduct ROW are Texas false saltgrass, Roetter's hedgehog cactus,

southwestern barrel cactus, and sand prickly pear (see Table 9-2.9). These species are not listed under the ESA.

Information was located for only one of the potentially occurring species. Many sand prickly pear have been observed through 1992 on BLM and private land within the area covered by the Anthony and La Union quadrangles (NMNHP 1999).

9-3.2.5.2.2 Field Survey Results. Surveys were not conducted for listed species at the site because habitat for four listed plant species occurring within or immediately adjacent to this project feature is poor quality (see Table 9-2.9). The corridor of this project feature is almost exclusively composed of cultivated fields, maintained orchards, or field roads. Therefore, no listed species would be expected to occur within the boundary of the corridor.

9-3.2.6 Well Sites (ASR)

9-3.2.6.1 Literature Review

Potentially occurring species at the well sites are: Texas false saltgrass, Wright's globemallow, long-stemmed flame flower, Roetter's hedgehog cactus, Duncan's hedgehog cactus, southwestern barrel cactus, sand prickly pear, Wooton's prickly pear, and night-blooming cereus (see Table 9-2.9). None of these species are listed by the ESA.

Information was found for one of the nine plant species potentially occurring on the site. Four night-blooming cereus were observed in 1988 on alluvial soils on sides of arroyos, on BLM land covered by the Newman quadrangle.

9-3.2.6.2 Field Survey Results

No surveys were conducted for listed species at these sites. Existing information was used to determine potential occurrence (see Table 9-2.9). The habitat quality ranges from poor to good and listed species have a high potential of occurring within this project feature.

9-3.3 Insects

The only potentially occurring insect, the Anthony blister beetle, has not been reported in the project area since 1963 (see Section 9-2.4.2). The potential occurrence of the species was considered remote; therefore, no surveys were conducted for the species.

9-3.4 Molluscs

Four listed molluscs, the Alamosa spring snail, Chupadera spring snail, Mineral Creek Mountain snail and Socorro spring snail, were evaluated to determine potential presence in the recent Elephant Butte/Caballo Reservoir Resource Management Plan EIS. These species are not known or suspected to occur in the USBR project area (USBR 1999).

Land snails listed for the remainder of the project area have very restricted distributions (See Section 9-2.4.3). Surveys were not specifically conducted for these species because of the low potential of occurrence and the absence of suitable habitat.

9-3.5 Amphibians and Reptiles

The literature review involved requesting lists from the BLM, and obtaining lists from state natural resources, natural heritage, and fish and game departments. In addition, the Elephant Butte and Caballo Reservoirs Resource Management Plan EIS and the BLM's *Environmental Report: Existing Management Situation* (1996) were consulted. No amphibian or reptiles in the project area are listed under the ESA (see Section 9-2.4). Several BLM-listed species potentially occur on land previously managed by BLM at one of the project features (El Paso Aqueduct).

9-3.5.1 Reservoir Sites

9-3.5.1.1 Literature Review

Only one threatened reptile, narrowhead garter snake (*Thamnophis ruficpunctatus*) was listed as a potentially occurring species at Elephant Butte and Caballo Reservoir in the Elephant Butte/Caballo Reservoirs Resource Management Plan EIS. This species is not expected to occur within or near the USBR project area (USBR 1999).

Based on the habitat present species potentially occurring in the reservoir area are the northern leopard frog, the Chiricahuan leopard frog, the New Mexico garter snake, the Big Bend slider, and the Texas horned lizard (see Table 9-2.11). Information was not available for listed herptiles in the reservoir areas.

9-3.5.1.2 Field Survey Results

Surveys were not conducted for listed species at the reservoir sites. Existing information was used to determine potential occurrence and abundance.

9-3.5.2 River Corridor

9-3.5.2.1 Literature Review

Species potentially occurring in the river corridor are the northern leopard frog, the Chiricahuan leopard frog, the New Mexico garter snake, the Big Bend slider, the New Mexico garter snake, and the Texas horned lizard (see Table 9-2.11). An extensive literature search was conducted to determine occurrence and abundance of listed species in the river corridor. Specific occurrence or abundance data for the listed species within the project area was available only for one of the listed species. An isolated population of Chiricahuan leopard frogs may be present near the project area in Ash Canyon, north of Radium Springs, in Doña Ana County, New Mexico (Stebbins 1985).

9-3.5.2.2 Field Survey Results

One listed herptile, a Texas horned lizard, was observed in the river corridor portion of the project area during the spring and summer 1999 field surveys. The lizard was observed in a floodplain near Hatch, New Mexico.

9-3.5.3 Treatment Plants

9-3.5.3.1 Literature Review

Species potentially occurring in this portion of the project area are the northern leopard frog, the Chiricahuan leopard frog, Texas lyre snake, the Big Bend slider, New Mexico garter snake, and the Texas horned lizard (see Table 9-2.11). Site-specific occurrence and abundance data were not located during the literature search.

9-3.5.3.2 Field Survey Results

No listed amphibians or reptiles were observed in the treatment plant portions of the project area during the spring and summer 1999 field surveys.

9-3.5.4 Westside Regulating Reservoir

9-3.5.4.1 Literature Review

The Texas horned lizard is the only listed amphibian which potentially occurs in this portion of the project area (see Table 9-2.12). Information about occurrence and abundance at the project feature was not located during the literature search.

9-3.5.4.2 Field Survey Results

No listed amphibians or reptiles were observed during surveys conducted at the proposed Westside Regulating Reservoir during spring and summer 1999 field surveys.

9-3.5.5 Aqueducts

9-3.5.5.1 El Paso

9-3.5.5.1.1 Literature Review. Species potentially occurring in the El Paso Aqueduct portion of the project area are the Texas lyre snake and the Texas horned lizard (see Table 9-2.12). Information about occurrence and abundance within and/or adjacent to the proposed ROW was not found during the literature search.

9-3.5.5.1.2 Field Survey Results. No listed amphibians or reptiles were observed in the El Paso Aqueduct portion of the project area during the spring and summer 1999 field surveys.

9-3.5.5.2 Texas–New Mexico

9-3.5.5.2.1 Literature Review. The only species likely to occur in the Texas–New Mexico Aqueduct portion of the project area is the Texas horned lizard (see Table 9-2.12). Information about occurrence and abundance within and/or adjacent to the proposed ROW was not found during the literature search.

9-3.5.5.2.2 Field Survey Results. No listed amphibians or reptiles were observed in the Texas–New Mexico Aqueduct portion of the project area during the spring and summer 1999 field surveys.

9-3.5.6 Well Sites/ASR

9-3.5.6.1 Literature Review

The only species potentially occurring in the well sites/ASR portions of the project area is the Texas horned lizard (see Table 9-2.12). No occurrence and abundance data for the listed species within the project area was available.

9-3.5.6.2 Field Survey Results

A Texas horned lizard was observed in the well sites/ASR portion of the project area during reconnaissance level field surveys. The lizard was in mesquite dune vegetation.

9-3.6 Fish

Three longfin dace, a federal species of concern and a BLM sensitive species, were collected during 1999 surveys of the lower Rio Grande. These surveys were conducted in the project area by the FWS. Additional information regarding the location and the results of additional ongoing FWS surveys in the Rio Grande will be discussed in the final report.

9-3.7 Birds

9-3.7.1 Reservoir Sites

9-3.7.1.1 Literature Review

The USBR evaluated 19 avian federal or state-listed endangered threatened and species of concern to determine potential presence in the Elephant Butte and Caballo Reservoir Resource Management Plan EIS. Neotropic cormorant, bald eagle, common black hawk, American peregrine falcon, mountain plover, southwestern willow flycatcher, and Bell's vireo are known to occur or suspected to occur in the project area. The remaining 12 listed bird species have a low potential of occurrence, because of lack of habitat or because they would infrequently visit the project area during migration (USBR 1999).

Sixteen species of listed birds potentially occur at Elephant Butte Reservoir and Caballo Reservoir, and along the Rio Grande between both reservoirs (see Table 9-2.14). The relatively high potential for listed species exists because the Rio Grande is a migratory corridor for birds (BioWest, Inc. 1996).

Listed species are primarily migratory birds and/or winter residents at the reservoirs and along the Rio Grande. Brown pelican, white-faced ibis, common black hawk, zone-tailed hawk, peregrine falcon, interior least tern, black tern, broad-billed hummingbird, and Bell's vireo are potential migrants. Potential winter residents include neotropic cormorant, bald eagle, northern goshawk, peregrine falcon, and whooping crane. Neotropic cormorant, common black hawk, yellow-billed cuckoo, western burrowing owl, southwestern willow flycatcher, loggerhead shrike, and Bell's vireo are potential summer residents. Brown pelican, bald eagle, interior least tern, and southwestern willow flycatcher are listed by the ESA.

The only source of information found regarding the status and abundance of listed bird species for aquatic and riparian habitats in the project area is a compilation of data for the Mimbres Resource Area in Sierra and Doña Ana Counties of New Mexico. This information is presented in Table 9-3.1. Table 9-3.2 lists the winter occurrence and abundance data of listed species for the Caballo Christmas Bird Count. Table 9-3.3 presents the winter bald eagle aerial survey data for Elephant Butte and Caballo Reservoirs. With the exception of the bald eagle, site-specific migratory and summer occurrence and abundance data were not located during the literature search. A pair of bald eagles was found nesting west of Caballo Reservoir in 1987. The nest site remained active at least through 1995. The adults and offspring foraged periodically at Caballo Reservoir (BioWest, Inc. 1996).

TABLE 9-3.1
Occurrence and Relative Abundance of Listed Birds Potentially Occurring in the Project Area

			Vegetation Community								
Family/Common Name	**Ab**	**Status**	**GR**	**CR**	**ME**	**DS**	**AR**	**RI**	**AQ**	**RA**	**FU**
Pelicans											
brown pelican	R	ACC/V							X		
Cormorants											
neotropic cormorant	U	R						X	X		
Ibises											
white-faced ibis	C	M	X					X	X		
Kites, Eagles, Hawks											
bald eagle	R	M/WR						X	X		
northern goshawk	U	R/WR						X			
ferruginous hawk	C	M/WR	X	X	X	X					X
common black hawk	R	M			X			X			
Falcons and Caracaras											
Aplomado falcon	R	ACC/V	X		X						
peregrine falcon	R	M/WRR	X			X	X	X			

TABLE 9-3.1
Occurrence and Relative Abundance of Listed Birds Potentially Occurring in the Project Area

			Vegetation Community								
Family/Common Name	**Ab**	**Status**	**GR**	**CR**	**ME**	**DS**	**AR**	**RI**	**AQ**	**RA**	**FU**
Cranes											
whooping crane	R	ACC/WR						X	X		X
Plovers											
mountain plover	R	UN/M	X						X		
Gulls and Terns											
black tern	R	M	X					X	X		
Pigeons and Doves											
common ground dove	U	M/WR	X		X						
Cuckoos, Roadrunners, and Anis											
yellow-billed cuckoo	R	M/SR						X			X
Typical Owls											
burrowing owl	C	R	X	X	X	X					X
Hummingbirds											
Costa's hummingbird	R	ACC/V					X				
broad-billed hummingbird	C	M/V	X	X	X	X	X	X			
Lucifer hummingbird	R	ACC/M				X					
Tyrant Flycatchers											
willow flycatcher	U	M/SR						X			
Shrikes											
loggerhead shrike	A	R	X	X	X	X	X	X			X
Vireos											
Bell's vireo	U	M/SR			X	X	X	X			
gray vireo	R	M/SR					X				
Cardinals, Grosbeaks, and Buntings											
varied bunting	R	M/SR						X			

Abundance(Ab)
C = Common
R = Rare
U = Uncommon

Status

R	=	Resident
M	=	Migrant
SR	=	Summer Resident
WR	=	Winter Resident
ACC	=	Accidental
UN	=	Unknown
V	=	Vagrant

Vegetation Community

GR	=	Grasslands
CR	=	Creosote bush
ME	=	Mesquite
DS	=	Desert Shrub
AR	=	Arroyos
RI	=	Riparian
AQ	=	Aquatic
RA	=	Rocky Areas
FU	=	Farmland/Urban

Source: USDI 1991

TABLE 9-3.2
Occurrence or Abundance of Listed Species on the 1986-1992 and 1994-1997 Caballo Christmas Bird Counts

	Years										
Common Name	**86**	**87**	**88**	**89**	**90**	**91**	**92**	**94**	**95**	**96**	**97**
neotropic cormorant	0	33	750	351	0	13	3	8	70	82	3
bald eagle	3	5	10	19	15	10	11	12	14	15	7
northern goshawk	1	4	2	1	2	3	2	2	1	2	2
ferruginous hawk	--	--	--	--	--	--	--	--	--	--	--
peregrine falcon	--	--	--	--	--	--	--	--	--	--	--
whooping crane	--	--	--	--	--	--	--	--	--	--	--
common ground	--	--	--	--	--	--	--	--	--	--	--
western burrowing owl	--	1	--	--	--	--	--	--	--	--	--
broad-billed hummingbird	--	--	--	--	--	--	--	--	--	--	--
loggerhead shrike	13	15	14	18	20	24	17	13	16	12	16
Baird's sparrow	--	--	--	--	--	--	--	--	--	--	--

Source: National Audubon Society 1986-1992,1994-1997

TABLE 9-3.3
Number of Bald Eagles Observed During Aerial Surveys—Elephant Butte Narrows to Caballo Dam

	Reservoirs		
Year **Month**	**Elephant Butte**	**Rio Grande**	**Caballo**
1996-1997			
October	--	--	--
November	--	--	--
December	2	--	2
January	69	--	30
1997-1998			
October	--	--	--
November	--	--	--
December	16	1	5
January	48	3	16

TABLE 9-3.3
Number of Bald Eagles Observed During Aerial Surveys—Elephant Butte Narrows to Caballo Dam

Year Month	Reservoirs		
	Elephant Butte	Rio Grande	Caballo
1998-1999			
October	--	--	--
November	--	--	--
December	2	1	1
January	12	--	16

Source: NMDGF 1997,1998,1999

9-3.7.1.2 Field Survey Results

Field surveys were not conducted for listed species. Occurrence data from the Department of the Interior, NMDGF, and the Bureau of Reclamation RMP/EIS on Elephant Butte Reservoir, were considered sufficient for occurrence and abundance data on listed birds.

9-3.7.2 River Corridor

Based on the habitat present and the habitat requirements of the species, 21 listed species of birds potentially occur along the Rio Grande corridor. As previously discussed, the relatively high potential of occurrence for listed species is because the Rio Grande is a migratory corridor for birds.

9-3.7.2.1 Literature Review

Brown pelican, whooping crane, interior least tern, and southwestern willow flycatcher are listed under the ESA. Table 9-3.1 lists the status and abundance of listed species potentially occurring in aquatic and riparian habitats along the Rio Grande. No data were located for El Paso County west of the Franklin Mountains; however, because of the similarity to habitats in Doña Ana and El Paso counties, the status and abundance of species would be similar.

Specific winter occurrence records for the listed species along the river corridor are provided in Tables 9-3.4 and 9-3.5, which indicate the Christmas Bird Counts for Las Cruces and El Paso, respectively. With the exception of southwestern willow flycatcher, no site-specific occurrence or abundance data were found for spring, summer, and fall. The only known southwestern willow flycatcher breeding site is located in Selden Canyon (Finch and Kelly 1999), where two breeding territories were located from 1994 through 1996. Southwestern willow flycatcher surveys were not conducted at these locations in 1997 and 1998.

TABLE 9-3.4
Occurrence and Abundance of Listed Species on the 1986 - 1992 and 1994 - 1997 Las Cruces Christmas Bird Counts

	Years										
Common Name	**86**	**87**	**88**	**89**	**90**	**91**	**92**	**94**	**95**	**96**	**97**
neotropic cormorant	--	--	--	6	--	5	--	--	1	--	3
bald eagle	--	--	--	--	--	--	--	--	--	--	--
northern goshawk		--	1	--	--	--	1	--	--	--	--
ferruginous hawk		6	5	5	5	5	7	5	1	2	3
peregrine Falcon		--	--	1	--	--	--	--	3	--	1
whooping crane	--	--	--	--	--	--	--	--	--	--	--
common ground	--	--	--	--	--	--	--	--	--	--	--
western burrowing owl		4	4	4	10	3	16	9	31	7	2
broad-billed hummingbird	--	--	--	--	--	--	--	--	--	--	--
loggerhead shrike		29	22	11	21	37	31	25	14	26	9
Baird's sparrow	--	--	--	--	--	--	--	--	--	--	--

Source: National Audubon Society 1986-1992,1994-1997

TABLE 9-3.5
Occurrence and Abundance of Listed Species on the 1986 - 1992 and 1994 - 1997 El Paso Christmas Bird Counts

	Years										
Common Name	**86***	**87***	**88***	**89***	**90**	**91**	**92**	**94**	**95***	**96**	**97***
neotropic cormorant	--	--	--	--	--	--	--	--	--	--	--
bald eagle	--	--	--	--	--	--	--	--	--	--	--
northern goshawk	--	--	--	--	1	--	--	--	--	--	--
ferruginous hawk	--	--	--	--	--	--	--	1	--	1	--
peregrine falcon	--	--	--	--	--	--	--	1	--	1	--
whooping crane	--	--	--	--	--	--	--	--	--	--	--
common ground dove	--	--	--	--	--	--	--	--	--	--	--
western burrowing owl	--	--	--	--	2	1	1	4	--	1	--
broad-billed hummingbird	--	--	--	--	--	1	--	--	--	--	--
loggerhead shrike	--	--	--	--	24	20	32	10	--	8	--
Baird's sparrow	--	--	--	--	--	--	--	--	--	--	--

*No Count conducted

Source: National Audubon Society 1986-1992,1994-1997

9-3.7.2.2 Field Survey Results

Reconnaissance level surveys were conducted for bald eagle and peregrine falcon during the winter and spring waterfowl and shorebird surveys along the Rio Grande (see Chapter 6, *Avian*). Species-specific surveys were conducted for southwestern willow flycatcher using the survey protocol recommended by Tibbets and others (1997). Surveys were not specifically conducted for the remainder of the potentially occurring species (see Table 9-3.1). These species are fairly common migrants in the project area, such as white-faced ibis; rare spring-fall migrants, such as Costa's hummingbird; and very rare winter residents, such as northern goshawk; or accidental, such as brown pelican. Reconnaissance-level surveys were conducted for these species along the Rio Grande during the winter and spring waterfowl and shorebird surveys.

9-3.7.2.2.1 Federal/State Endangered, Threatened, and Proposed Threatened Species. Neotropic cormorant, white-faced ibis, bald eagle, peregrine falcon, yellow-billed cuckoo, southwestern willow flycatcher, and Bell's vireo were observed during the surveys. All other potentially occurring federal or state endangered, threatened, and proposed threatened species were not observed during the surveys (see Chapter 6, *Avian*).

9-3.7.2.2.1.1 Neotropic Cormorant. Neotropic cormorants were observed during all waterfowl and shorebird surveys conducted along the Rio Grande in New Mexico (Table 9-3.6). This species was observed from below the Caballo spillway to the New Mexico–Texas state line.

TABLE 9-3.6
Neotropical Cormorant Observations During Winter 1999 Waterfowl and Shorebird Surveys

No. of Individuals	Date	Location
1	18 Jan.	Segment II; River Mile 12-13
1	27 Jan.	Segment I; River Mile 50-51
1	28 Jan.	Segment II; River Mile 1-2
2	28 Jan.	Segment II; River Mile 17-18
1	14 Mar.	Segment I; River Mile 42-43
2	15 Mar.	Segment I; River Mile 42-43
2	23 Mar.	Segment I; River Mile 16-17
1	23 Mar.	Segment I; River Mile 21-22
1	24 May	Segment I; River Mile 21-22
4	7 May	Segment I; River Mile 16-17
3	7 May	Segment I; River Mile 22-23
2	7 May	Segment I; River Mile 30-31

TABLE 9-3.6
Neotropical Cormorant Observations During Winter 1999 Waterfowl and Shorebird Surveys

No. of Individuals	Date	Location
2	9 May	Segment II; River Mile 54-55
1	18 May	Segment II; River Mile 18-19

Note: Segment I — Rio Grande Electric Plant in El Paso, Texas, to Leasburg.
Segment II — Head of Selden Canyon to Hwy 185 Bridge near Arrey, New Mexico.

9-3.7.2.2.1.2 White-Faced Ibis. This species was fairly common in the project area during spring migration. An estimated 200 white-faced ibis were observed flying north over the Rio Grande during the surveys; 100 near Mesquite, New Mexico, on April 27, 1999, and 100 at River Mile 16 near Canutillo, Texas, on May 7, 1999.

9-3.7.2.2.1.3 Bald Eagle. Two bald eagles were observed during each weekly winter waterfowl and shorebird survey in January (Table 9-3.7). Both of the birds were found along the Rio Grande in Doña Ana County, New Mexico. Bald eagles were not observed during spring surveys along the Rio Grande.

TABLE 9-3.7
Bald Eagle Observations During Rio Grande Winter 1999 Waterfowl and Shorebird Surveys

No. of Individuals	Date	Location
1 (I)	8 Jan.	Segment I; River Mile 33-36
1 (A)	9 Jan.	Below Leasburg Dam
1 (I)	12 Jan.	Segment I; River Mile 24–25
1 (A)	13 Jan.	Segment I; River Mile 49-50
1 (A)	14 Jan.	Segment II; River Mile 2-3
1 (A)	18 Jan.	Segment II; River Mile 2-3
1 (A)	28 Jan.	Segment II; River Mile 10-11

A = Adult I = Immature

Note: Segment I — Rio Grande Electric Plant in El Paso, Texas, to Leasburg.
Segment II — Head of Selden Canyon to Hwy 185 Bridge near Arrey, New Mexico.

9-3.7.2.2.1.4 Peregrine Falcon. A pair of adult peregrine falcons was observed over the Rio Grande at the American Dam, in El Paso County, Texas, on January 6, 1999 (Table 9-3.8). One or both of the peregrine falcons were observed throughout the month of January during waterfowl and shorebird surveys at the American Dam. A site manager at the nearby American Brick Plant stated that the falcons had been present for the last three years. In addition to this pair, an immature peregrine falcon was found perched in a tree just outside of the river corridor south of Las Cruces, New Mexico, on January 12, 1999. The peregrine falcons were not observed during spring surveys at the American Dam or along the Rio Grande during spring waterfowl and shorebird surveys. The potential still exists that the pair may be nesting on cliffs in the nearby Franklin Mountains, on a rooftop/ledge of a tall building in El Paso, or outside of the project area.

TABLE 9-3.8
Peregrine Falcon Observations During Rio Grande Winter 1999 Waterfowl and Shorebird Surveys

No.	Date	Location
2 (A)	6 Jan.	Asarco Plant/American Dam
1 (A)	11 Jan.	Asarco Plant/American Dam
1 (A)	22 Jan.	Asarco Plant/American Dam
2 (A)	25 Jan.	Asarco Plant/American Dam
1 (A)	12 Jan.	Segment I; River Mile 25-26

A = Adults

Note: Segment I Rio Grande Electric Plant in El Paso, Texas, to Leasburg.

9-3.7.2.2.1.5 Yellow-Billed Cuckoo. Yellow-billed cuckoos were found during southwestern willow flycatcher surveys conducted in Selden Canyon. Five yellow-billed cuckoos, including one pair, were detected in June and four yellow-billed cuckoos, including one pair, were detected in July. Including the observed pair, it was estimated that three territories were present (Border Wildlife Consultants 1999).

9-3.7.2.2.1.6 Southwestern Willow Flycatcher. Southwestern willow flycatcher surveys were conducted in Selden Canyon, New Mexico. Six pairs of southwestern willow flycatchers were located during the surveys. One territorial pair was found on the west bank; five nesting pairs were found on the east side of the Rio Grande (Border Wildlife Consultants 1999).

9-3.7.2.2.1.7 Bell's Vireo. One singing Bell's vireo was found during each of the southwestern willow flycatcher surveys (Border Wildlife Consultants 1999). No Bell's vireo were observed during migration.

9-3.7.2.2.2 Federal and State Species of Concern and Sensitive Species. White-faced ibis, ferruginous hawk, western burrowing owl, and loggerhead shrike were observed from the USIBWC levee road during the winter and spring waterfowl and shorebird surveys.

Mountain plover, northern goshawk, black tern, Lucifer hummingbird, yellow-billed cuckoo, and Baird's sparrow were not observed during the surveys (see Chapter 6, *Avian*).

9-3.7.2.2.2.1 White-Faced Ibis. As previously discussed, white-faced ibis was fairly common in the project area during spring migration. Approximately 200 white-faced ibis were observed flying north over the Rio Grande during the survey; approximately 100 near Mesquite, New Mexico, on April 27, 1999, and 100 at River Mile 16 near Canutillo, Texas, on May 7, 1999.

9-3.7.2.2.2.2 Ferruginous Hawk. Four to seven individuals were observed from the USIBWC levee road during each weekly waterfowl and shorebird survey in January (see Table 9-3.9). Ferruginous hawks were observed perched near or feeding along the edges of agricultural fields and in the river corridor.

9-3.7.2.2.2.3 Western Burrowing Owl. Three western burrowing owls were observed from the USIBWC levee road during the spring waterfowl and shorebird surveys. Two were found March 14, 1999, in Rio Grande Segment I between RM 29 and RM 31. The other was located in Rio Grande Segment I between RM 19 and RM 28 on May 7, 1999. The owls were found in or near irrigated agricultural land.

TABLE 9-3.9
Ferruginous Hawk Observations During Winter 1999 Waterfowl and Shorebird Surveys

Number of Individuals	Date	Location
1 (A)	7 Jan.	Segment I; River Mile 13-15
1 (A)	8 Jan.	Segment I; River Mile 31-60
4 (A)	9 Jan.	Segment II; River Mile 0-24
1 (I)	9 Jan.	Segment II; River Mile 0-24
1(A)	13 Jan.	Segment I; River Mile 28+29
4 (A)	14 Jan.	Segment II; River Mile 0-12
1 (I)	15 Jan.	Segment II; River Mile 13-24
1 (A)	20 Jan.	Segment I; River Mile 13-15
1 (I)	21 Jan.	Segment I; River Mile 12-13
1 (I)	26 Jan.	Segment I; River Mile 12-13
1 (A)	27 Jan.	Segment I; River Mile 40-60
2 (A)	28 Jan.	Segment II; River Mile 0-24
1 (A)	14 Mar.	Segment I; River Mile 22-23

TABLE 9-3.9
Ferruginous Hawk Observations During Winter 1999 Waterfowl and Shorebird Surveys

Number of Individuals	Date	Location
1 (A)	15 Mar.	Segment I; River Mile 22-23
1 (I)	15 Mar.	Segment I; River Mile 13-15
1 (I)	23 Mar.	Segment I; River Mile 13-15

A = Adult I = Immature

Note: Segment I Rio Grande Electric Plant in El Paso, Texas, to Leasburg.
Segment II Head of Selden Canyon to Hwy 185 Bridge near Arrey, New Mexico.

9-3.7.2.2.2.4 Loggerhead Shrike. Loggerhead shrikes were observed during each weekly waterfowl and shorebird survey along the Rio Grande during January (see Table 9-3.10). However, only one adult bird was found during the spring and summer surveys.

TABLE 9-3.10
Loggerhead Shrike Observations During Rio Grande Waterfowl and Shorebird Surveys

No. of Individuals	Date	Location
1	6 Jan.	Segment I; River Mile 6-13
1	7 Jan.	Segment I; River Mile 13-31
1	8 Jan.	Segment II; River Mile 31-60
2	10 Jan.	Segment II; River Mile 14-24
1	13 Jan.	Segment I; River Mile 40-60
1	15 Jan.	Segment II; River Mile 12-24
1	21 Jan.	Segment II; River Mile 6-330
1	20 Jan.	Segment I; River Mile 35-60
1	17 Jan.	Segment I; River Mile 13-15
1	26 Jan.	Segment I; River Mile 17-40
1	27 Jan.	Segment I; River Mile 41-59
3	14 Jan.	Segment II; River Mile 12-24
1	14 Mar.	Segment I; River Mile 49-50
2	15 Mar.	Segment I; River Mile 12-24
1	15 Mar.	Segment I; River Mile 49-50
2	23 Mar.	Segment I; River Mile 22-23
2	23 Mar.	Segment I; River Mile 12-24

TABLE 9-3.10
Loggerhead Shrike Observations During Rio Grande Waterfowl and Shorebird Surveys

No. of Individuals	Date	Location
2	24 Mar.	Segment I; River Mile 12-24
1	5 May	Segment I; River Mile 49-50

Note: Segment I — Rio Grande Electric Plant in El Paso, Texas, to Leasburg.
Segment II — Head of Selden Canyon to Hwy 185 Bridge near Arrey, New Mexico.

9-3.7.3 Water Treatment Plants

9-3.7.3.1 Literature Review

Nine listed species could potentially occur on the proposed Hatch, Leasburg, Las Cruces I-10, Anthony, Upper Valley, and Jonathan Rogers sites (see Table 9-2.14). Northern goshawk, peregrine falcon, whooping crane, mountain plover, common ground dove, and western burrowing owl could use the open fallow and/or graded dirt fields at these sites for feeding (see Table 9-3.1). Yellow-billed cuckoo could use the pecan orchards for feeding and roosting at the Las Cruces I-10 site. Bell's vireo, gray vireo, and varied hunting could utilize Chihuahua Desert scrub (creosote and mesquite) habitat at Leasburg. Loggerhead shrike could potentially use mesquite habitat at Leasburg and disturbed grasslands at Jonathan Rogers for feeding or roosting. Whooping crane is the only species listed under the ESA.

Northern goshawk normally winters in mountain forests and valleys; however, it moves irregularly out of its normal habitat into desert lowlands during the winter (National Geographic Society 1989). Several northern goshawks have been found in the Las Cruces Christmas Bird Counts (see Table 9-3.4).

Peregrine falcon is primarily a migrant in the project area. Some occasionally winter in the project area (see Table 9-3.4 and Table 9-3.5)

Whooping crane is a potential migrant or winter resident in the project area. The whooping crane is considered accidental in both Sierra and Doña Ana Counties (USDI 1991). This status is supported by data from the Caballo, Las Cruces, and El Paso Christmas Bird Counts where no whooping cranes have been recorded in recent years (see Table 9-3.2, Table 9-3.4, and Table 9-3.5).

Mountain plover was not listed as a occurring species in Doña Ana and Sierra counties by the BLM (USDI 1991). No historic mountain plover breeding records exist for either county (NMGFD 1996). Spring and fall occurrence records for migratory mountain plovers were not found during the literature search.

Common ground dove is listed as an uncommon bird in Sierra and Doña Ana counties (DOI 1991). However, it has not been recorded on any of the recent Christmas Bird Counts

conducted by local National Audubon Society chapters (see Table 9-3.2, Table 9-3.4, and Table 9-3.5).

Yellow-billed cuckoo is not listed as a potentially occurring species in the Mimbres Resource Area of Doña Ana and Sierra counties (USDI 1991b). However, no recent surveys have been conducted along the Rio Grande. Because the species is known to nest north of Elephant Butte Reservoir, the potential exists that species may use habitat in the project area as a stopover site during migration or for nesting.

Broad-billed, Lucifer, and Costa's hummingbirds are rarely observed in the project area (see Table 9-3.1). These vagrants would not be expected to occur regularly.

Western burrowing owl is listed as a common resident species in Doña Ana and Sierra counties (USDI 1991b). The species is reported to be fairly common at Fort Bliss from late spring to late fall and are very rare during winter (Department of Defense 1996).

Bell's vireo is now a rare migrant or summer resident in the project area. Gray vireo is an uncommon summer resident in the foothills, however some occur occasionally as migrants or winter residents in the lowlands.

Loggerhead shrike is a common winter and uncommon summer resident in the project area (USDI 1991). This species ranges from fairly common to common during winter (see Tables 9-3.4 and 9-3.5).

9-3.7.3.2 Field Survey Results

9-3.7.3.2.1 Federal and State Endangered and Proposed Threatened Species.

Reconnaissance-level surveys were conducted at each treatment plant. Peregrine falcons were not observed during the surveys.

Reconnaissance-level surveys of agricultural fields adjacent to the USIBWC levee roads were conducted during all winter and spring waterfowl and shorebird surveys. No whooping cranes were observed during these surveys.

Reconnaissance-level surveys of recently plowed and graded agricultural fields adjacent to the USIBWC levee roads for mountain plover were conducted on March 14, 15, 23, and 24, 1999. Although no mountain plover were observed during the survey, the potential still exists that mountain plover could occur during migration because it was not practical to survey all fallow or graded agricultural lands in the project area.

Common ground dove is listed as an uncommon bird in Sierra and Doña Ana counties (USDI 1991). This species was not observed during the 25 days of winter and spring reconnaissance-level surveys conducted along the Rio Grande (see Chapter 6, *Avian*).

9-3.7.3.2.2 Federal and State Species of Concern and Sensitive Species. Northern goshawk could potentially winter on the Las Cruces I-10 site. This species was not observed

during winter and spring waterfowl and shorebird surveys along the Rio Grande (see Chapter 6, *Avian*).

Western burrowing owl was the only species that could potentially nest on the proposed sites. Reconnaissance-level surveys were conducted at each of the sites. No burrowing owl(s) were observed during surveys at Hatch, Las Cruces I-10 , Leasburg, and Anthony sites. One burrowing owl was found adjacent to the Rowley lateral on the Upper Valley site.

Listed hummingbirds and vireos were not observed during any of the surveys. The Leasburg site, which has the best potential habitat for these species, was not added as a project feature until late October. These species would not have been detectable during the November survey. Although the possibility of occurrence is low for the listed hummingbirds because of their vagrant status, both of the vireos could occur as migrants or summer residents (primarily Bell's vireo).

One loggerhead shrike was found during the survey of the Leasburg site. Additional shrikes could occur near or at the diversion sites or in the transmission corridor.

9-3.7.4 Westside Regulating Reservoir

9-3.7.4.1 Literature Review

Eight listed species of birds could potentially occur at the proposed site (see Table 9-2.14). Suitable nesting habitat is present for common ground dove because of the mixed disturbed non-native/native vegetation present at the site. Yellow-billed cuckoo, broad-billed hummingbird, Lucifer hummingbird, Costa's hummingbird, Bell's vireo, gray vireo, and varied bunting may occur as migrants (see Table 9-3.1). These species are not listed under the ESA.

Most of the species are considered uncommon or rare spring and fall migrants or accidental visitors (see Table 9-3.1). Based on data from the Las Cruces Christmas Bird Count, common ground dove does not normally occur in winter (see Table 9-3.4). No site-specific occurrence records were found for the remaining species.

9-3.7.4.2 Field Survey Results

None of the listed species were observed during the May 29, 1999 site survey. However, because the survey was limited to a single area search survey, the potential occurrence of listed migratory species cannot be eliminated.

9-3.7.5 Aqueducts

9-3.7.5.1 El Paso

9-3.7.5.1.1 Literature Review. Thirteen listed bird species have the potential to occur within the proposed ROW for the El Paso Aqueduct (see Table 9-2.14). Potential migrants/ winter residents include northern goshawk, zone-tailed hawk, ferruginous hawk, peregrine

falcon, whooping crane, mountain plover, Costa's hummingbird, Lucifer hummingbird, and Bell's vireo. Common ground dove, western burrowing owl, and gray vireo may occur either as a migrant or summer resident. Loggerhead shrike would be expected to be a permanent resident.

Table 9-3.1 lists the occurrence and abundance data for potentially occurring species along the El Paso Aqueduct ROW. Winter occurrence records for the species are listed in Tables 9-3.2, 9-3.4, and 9-3.5.

9-3.7.5.1.2 Field Survey Results. None of the potentially occurring listed species were observed during surveys of the ROW from June 2 through 7, 1999. However, these species could occur in the ROW during winter and/or migration. Two loggerhead shrike and western burrowing owl were found during subsequent surveys.

9-3.7.5.2 New Mexico–Texas

9-3.7.5.2.1 Literature Review. Seven listed species potentially occur along the proposed New Mexico–Texas Aqueduct corridor (See Table 9-2.14). Whooping crane and mountain plover may feed in the agricultural lands within the ROW during winter and spring and fall migrations. Common ground dove and western burrowing owl could use agricultural land for feeding and nesting throughout the year. Ferruginous hawks could feed in the agricultural fields during migration and winter. Northern goshawk could use the edges of the pecan groves in the winter for hunting perches. Bell's vireo could feed and rest in some of the pecan orchards along the ROW during migration. Whooping crane is the only species listed under the ESA.

Ferruginous hawk is listed as a common species in Doña Ana and Sierra counties (see Table 9-3.1). Western burrowing owl is common in the project area (USDI 1991). Current records are known for whooping crane, mountain plover, and common ground dove (see Table 9-3.2, Table 9-3.4, and Table 9-3.5). Bell's vireo is listed as uncommon and gray vireo is listed as rare in the counties of the project area (see Table 9-3.1).

9-3.7.5.2.2 Field Survey Results. None of the listed bird species were observed during the June survey period. However, those species listed as migrants could occur in the proposed aqueduct corridor. No whooping cranes, mountain plovers, or common ground doves were found during reconnaissance-level survey of agricultural lands at other project features.

9-3.7.6 Aquifer Storage and Recovery (ASR)

9-3.7.6.1 Literature Review

Five listed species potentially occur at the ASR well sites (see Table 9-2.14). Ferruginous hawks may use the area for feeding during migration or in winter. Common ground dove and varied bunting could nest in the project area. Bell's vireo may use mesquite thickets for feeding and roosting during migration. Loggerhead shrike would be expected to be a year-round resident. These species are not listed under the ESA.

Table 9-3.11 lists the occurrence status of potentially occurring listed species on the Fort Bliss Military Reservation. Loggerhead shrike was the only listed species found during extensive breeding bird surveys of creosote and mesquite habitats on military land operated by Fort Bliss (COE 1998). Ferruginous hawk is classified as a common bird in nearby Doña Ana County (USDI 1991a).

TABLE 9-3.11
Listed Species Potentially Occurring at the Well Sites (ASR)

Common Name	Status	Spring	Summer	Fall	Winter
bald eagle	Very rare	X		X	X
ferruginous hawk	Uncommon	X		X	X
peregrine falcon	Very rare	X		X	
yellow-billed cuckoo	Uncommon	X	X		
burrowing owl	Fairly common	X	X	X	
Costa's hummingbird	Very rare	X			
loggerhead shrike	Common/Uncommon	X	X	X	X
Bell's vireo	Very rare			X	
varied bunting	Very rare	X			

Source: USDI 1996

9-3.7.6.2 Field Survey Results

Surveys were not conducted because well-head locations had not been finalized. These sites will be surveyed when the sites for the wells are confirmed. The survey results will be assessed and subsequently reviewed by FWS. If necessary, a conservation plan will be developed to a conceptual level and approved by FWS.

9-3.8 Mammals

9-3.8.1 Literature Review

As previously discussed in Section 9-2.4.7, no mammal listed under the ESA would occur in the project area. Table 9-3.12 lists the known habitat of the remaining listed species. Reconnaissance-level surveys for listed mammals were conducted during listed species (see Table 9-3.12), vegetation mapping, wetland delineation, amphibian and reptile, bird, and mammal track/scat surveys. Searches also were conducted during wildlife surveys of agricultural lands.

TABLE 9-3.12
Occurrence and Relative Abundance of Listed Mammals Potentially Occurring in the Project Area

		Vegetation Community								
Family/Common Name	**Abundance**	**GR**	**CR**	**ME**	**DS**	**AR**	**RI**	**AQ**	**RA**	**FU**
Bats										
cave myotis	Uncommon	X	X	X	X	X	X		X	
Yuma myotis	Uncommon						X		X	
little brown myotis	Uncommon						X		X	
fringed myotis	Common	X		X	X	X	X		X	
long-legged myotis	Common						X		X	
small-footed myotis	Uncommon	X	X				X		X	
red bat	Rare					X	X			
spotted bat	Rare						X		X	
Townsend's big-eared bat	Uncommon				X	X	X		X	
big free-tailed bat	Rare	X	X	X	X	X	X		X	
Squirrels and Chipmunks										
black-tailed prairie dog	Uncommon	X								
Pocket Gophers										
Botta's pocket gopher	Common	X	X	X	X	X	X		X	
desert pocket gopher	Common	X		X	X					
Pocket Mice										
rock pocket mouse	A	X		X	X	X			X	
Skunks										
western spotted skunk	Uncommon	X			X	X	X		X	

Sources: Davis and Schidley 1994; Findley et al. 1975; USDI 1991b

Vegetation Community

GR	=	Grasslands
CR	=	Creosotebush
ME	=	Mesquite
DS	=	Desert Shrub
AR	=	Arroyos
RI	=	Riparian
AQ	=	Aquatic
RA	=	Rocky Areas
FU	=	Farmland/Urban

Large numbers of bats (200,000 to 500,000) have been reported from caves on private land adjacent to Elephant Butte Reservoir. Listed species known to occur include fringed myotis and Yuma myotis. Townsend's big-eared bat and free-tailed bat occur. Spotted bat is known or suspected to occur at the reservoirs (USBR 1999). The reservoirs may provide important feeding areas for these bats (BioWest 1996).

Listed bat species were not observed during the surveys. Although no bats were observed in an old water well shaft next to the house on the Upper Valley site, the potential still exists that they may colonize the site. With the exception of the Upper Valley WTP site, no caves, old mine shafts, or wells were found at the other project features. Most of the listed bats would be expected to migrate through or feed in the project area.

9-3.8.2 Survey Results

Two Botta's pocket gopher, a New Mexico species of concern, were observed in the proposed El Paso Aqueduct ROW. Four clusters of pocket gopher mounds (species unknown) were present within the El Paso Aqueduct ROW. Skunk tracks and scat were fairly common along the Rio Grande (see Chapter 7, *Mammals*). All of the skunks observed were striped skunks. The potential exists that western spotted skunk may occur in the project area.

The USBR evaluated potential presence of federal or state-listed endangered and threatened plant species in the Elephant Butte and Caballo Reservoir Resource Management Plan EIS. The study area for this project (Elephant Butte and Caballo Reservoirs and the Rio Grande between the reservoirs) is primarily lowland habitats (open water of the reservoirs, shoreline and riparian communities), unlike the more upland terrestrial habitats in the USBR project area.

The USBR evaluated habitat for button cactus (*Epithilantha micromeris*), Castetter milkvetch (*Astragalus castetteri*), Duncan's cory cactus (*Coryphantha duncanii*), Fugate's amsonia (*Amsonia fugatei*), and Sanberg's pincushion cactus (*Escobaria sanbergii*). These species are not known or suspected to occur in the project area covered by the USBR's EIS (USBR 1999). Rare and sensitive plants listed by the State of New Mexico that are not evaluated in the Elephant Butte and Caballo Reservoir Management Plan EIS are evaluated in this section.

9-4.0 Environmental Consequences and Conservation

This section describes the probable consequences of each alternative on endangered, threatened, candidate, and sensitive species and species of concern (T&E species). Impact analysis is based on surveys conducted in January and March through July 1999. If a species was not observed at a site or has not been recorded as occurring at a site, it was assumed to not currently reside at the site. However, if suitable habitat for that species is present at the site, impacts were determined based on project-related habitat changes from both a local and regional perspective.

9-4.1 Potential Issues Eliminated from Further Analysis

A request during the scoping process to use conditions prior to the construction of Caballo and Elephant Butte Dams to assess environmental impacts of the alternatives was considered. Because construction of the reservoirs is not part of this project, it was eliminated from further analysis relative to impact assessment (CH2M HILL 1999b). However, it will be used as a context for describing the project in the EIS.

9-4.2 Issues Addressed in the Impact Analysis

During the public scoping process, the following issues related to biological resources were identified to be addressed in the EIS (CH2M HILL 1999b):

- Discuss impacts on upstream (Elephant Butte and Caballo Reservoirs) and downstream areas
- Conduct surveys on all project features
- Conduct seasonal fish and wildlife studies for a 2-year period

9-4.3 Significance Criteria

Under the Endangered Species Act (ESA) of 1973, as amended, it is the responsibility of the federal action agency(s) or their designee to determine whether the proposed action may affect any listed or proposed species. Section 7 of the Act requires federal agencies to consult with the FWS should it be determined that their actions may affect a listed threatened or endangered species. Section 9 of the Act prohibits the “take” (harm, harassment, pursuit, injury, or kill) of federally listed wildlife species by any person subject to the jurisdiction of the United States. “Harm” is further defined to include habitat modification or degradation where it kills or injures wildlife by significantly impairing essential behavioral patterns including breeding, feeding, or sheltering. Take can only be permitted pursuant to the pertinent language and provisions on Section 7, for federal actions, or section 10 (a)(1)(B), which provides for incidental take of threatened or endangered species on private lands. If appropriate, authorization from the FWS for take of threatened or endangered species must be obtained prior to initiating projects to avoid violations of the ESA.

9-4.4 No Action Alternative

The No Action Alternative for this project is the affected environment with predicted trends through the three-phase, 30-year term of the project. Baseline biological conditions were projected through time to develop expected trends and future conditions.

9-4.4.1 Trends

Channelization of the Rio Grande and the removal of floodplain vegetation for agricultural production have significantly affected biological resources in the project area over the last 100 years. A wide variety of relatively common species in the early 1900s have become federally and/or state-listed species, rare and sensitive species, and species of concern. Current trends in the project area involve conversion of agricultural lands for municipal, industrial, and urban use. Native aquatic and terrestrial habitat is now rare in most of the immediate project area because of these activities. Native habitat that is present is generally limited to narrow discontinuous patches along the river to more extensive areas of semi-disturbed to native habitats in the mountains.

9-4.4.2 Future Conditions

Conversion of agricultural land to municipal and industrial (M&I) use would be expected to continue throughout the project area. Development would be concentrated southeast of the City of El Paso, and between El Paso and Las Cruces. The demand for water would continue to increase. Expected future trends for biological resources under the No Action Alternative include the following:

- Drains would continue to provide some of the best aquatic and riparian habitat
- Urbanization would result in a decrease in the number of drains and poorer habitat within drains
- Conversion of water rights to municipal and industrial uses would reduce drain flows and affect drain habitat
- Ecosystem/watershed management needs would continue to grow
- Water would be managed in an increasingly litigious and reactive setting
- Lack of suitable riverine habitat would continue to limit aquatic species
- Current seasonal flow patterns in the river would not change; fish and wildlife habitat in the active channel would remain the same
- Extreme water conservation measures would decrease wildlife habitat values within urban areas

- Demands for surface water may interfere with the current management trend to allow some riparian habitat to develop within the levees

9-4.4.3 Impacts of the No Action Alternative

Short-term impacts would not occur to listed species (endangered species, threatened species, candidate species, sensitive species, and species of concern) because no construction would occur at Elephant Butte or Caballo Reservoirs.

Listed plant species are not presently known to occur in the USBR project area (USBR 1999) at the two reservoirs. Listed or recently de-listed animal species known to occur or suspected to occur in the USBR project area include: American peregrine falcon, southwestern willow flycatcher, bald eagle, neotropic cormorant, common black hawk, Bell's vireo, mountain plover, Rio Grande silvery minnow, and spotted bat (USBR 1999). Permanent or summer resident listed species at the reservoirs include neotropical cormorant and Bell's vireo. Bald eagles are primarily winter residents. Common black hawk, American peregrine falcon, and southwestern willow flycatcher are migrants. The status of the mountain plover is unknown. Mountain plover would not be expected in reservoir shoreline communities because the species prefers upland vegetation communities. The Rio Grande silvery minnow occurs north of Elephant Butte Reservoir and would not be affected by the project. Spotted bats have been reported to roost at sites adjacent to the reservoirs and would be expected to feed at the reservoirs. Other listed species (yellow-billed cuckoo, Baird's sparrow, brown pelican) not known to occur at the reservoirs could occur as migrants or accidentally after storms (USBR 1999).

Chapter 3, *Vegetation*, discusses water surface elevations in Elephant Butte and Caballo Reservoirs during Phases 1, 2, and 3 (years 2010, 2020, and 2030) under the No Action Alternative (see Section 3-4.4.3 and Table 3-4.1). Based on model predictions and this discussion, no significant net changes to shoreline wetland and riparian vegetation would occur. Therefore, no effects to listed, proposed, or recently de-listed threatened or endangered species are expected. In addition, as discussed in Chapter 6, increased shallow water areas associated with increasing water surface elevations would benefit aquatic bird communities and raptors, such as bald eagle, that prey on forage fish species. Fish would generally benefit from increased spawning and rearing areas in Elephant Butte Reservoir (see Chapter 10, *River and Drain Fish Habitat Assessment*).

Average monthly water level changes at Caballo Reservoir between the three phases of the project would be very minor (see Table 3-4.2) and would not affect listed species. Major changes (greater than 10 percent) in average river and drain flows would not occur with implementation because no changes would be made to the existing Rio Grande Compact (Boyle Engineering 1999). Any effects to listed species within the river corridor would be expected to be non-significant.

A current management trend in the project area to use surface water to develop additional riparian habitat may no longer be possible, because all available water may be needed for M&I use. Without additional water, the recovery of habitat necessary for species such as the northern leopard frog (a Texas species of concern) would be unlikely to occur in the future.

The decrease in the number of urban drains, drain flow, and suitable urban habitats because of urbanization and extreme water conservation measures (which would lower drain water levels and possibly decrease cover in the longer term) would result in an unknown decrease in the quality and quantity of habitat for the New Mexico garter snake (a Texas species of concern), and migratory "stopover" habitat for neotropical birds, including listed migratory species (Bell's vireo, southwestern willow flycatcher, yellow-billed cuckoo), and feeding habitat for listed bats.

9-4.5 Preferred Alternative—River with Local Plants

Construction activities associated with this project may directly and/or indirectly affect listed species by disturbing, altering, and converting existing habitat to other land uses, displacing the species either permanently or temporarily, or eliminating the species. For this project, operational activities (changes in reservoir levels and river flow, water treatment plant and aquifer storage and recovery operation) may affect listed species by altering or creating aquatic habitats.

9-4.5.1 Reservoirs

9-4.5.1.1 Plants

Listed plant species are not presently known to occur in the USBR project area at the reservoirs (USBR 1999). Fugate's amsonia has the greatest potential to occur at the reservoirs. This species is found in creosotebush shrubland, one of the dominant plant communities at Elephant Butte Reservoir.

9-4.5.1.1.1 Phase 1—Construction. No construction activities (ground clearing) would occur at Elephant Butte or Caballo Reservoirs during any of the project phases. No short-term effects would occur to listed (endangered species, threatened species, candidate species, species of concern or sensitive species) plants.

9-4.5.1.1.2 Phase 1—Operation. Reservoir operations would not change significantly from the No Action Alternative in Elephant Butte Reservoir (see Table 3-4.3) or Caballo Reservoir (see Table 3-4.4). Listed plants are not known to occur at the reservoirs (see Section 9-3.2.1.1). Therefore, no long-term effects would be expected to listed plant species during operations.

9-4.5.1.1.3 Phase 2—Construction. No construction activities or effects would occur at the reservoirs.

9-4.4.5.1.1.4 Phase 2—Operation. Reservoir operations would not change significantly from the No Action Alternative during Phase 2 (see Tables 3-4.5 and 3-4.6). Also, listed plants are not known to occur at the reservoirs (see Section 9-3.2.1.1). Therefore, no long-term affects would be expected to listed plant species during operations.

9-4.4.5.1.1.5 Phase 3—Construction. No construction activities or effects would occur at the reservoirs.

9-4.4.5.1.1.6 Phase 3—Operation. During Phase 3, water levels at Elephant Butte Reservoir are predicted to change compared to both the No Action Alternative and to Phase 2 levels (see Tables 3-4.5 and 3-4.7). Compared to No Action, average monthly water levels would increase by 2 to 3 feet during an average water year. Average monthly water levels during Phase 3 would be 3 to 4 feet higher than predicted for Phase 2 of this alternative. Changes of this magnitude between Phases 2 and 3 would slowly flood an undetermined portion of the wetland and riparian vegetation that exists around the reservoir and displace the existing communities up the slope of the reservoir shoreline. This would result in significant short-term effects to these plant communities because of the lag time between flooding effects and development of new vegetation. These effects would persist until new wetland and riparian plant communities develop at the higher water level, which is discussed below.

The change in water levels (and expected vegetation effects) would likely occur gradually over the 10-year duration of Phase 3 as new facilities come on line. Therefore, shoreline vegetation would have the opportunity to migrate up the reservoir shoreline at the same time that lower elevation plants are being flooded. On a temporal scale, the replacement would not occur on a one-to-one basis. There would be some lag time between when wetland and riparian vegetation is flooded during each water level rise and when that same amount of vegetation redevelops at the new higher level.

Water levels are not projected to fluctuate by more than 1 foot between February and July and would decline by 2 to 3 feet from these levels during August and September. This type of drawdown is not unlike those observed under natural conditions and is probably less than many natural systems experience. Stable water levels during much of the growing season would be expected to result in development of new wetland and riparian communities along the shore of Elephant Butte Reservoir. Herbaceous wetland communities would colonize higher slopes more quickly and impacted vegetation should be fully replaced within less than 5 years. Shrubby species such as willow and tamarisk would require longer for full replacement. Large woody species such as cottonwood would colonize higher slopes quickly but would not reach full stature (thereby replacing lost wildlife values associated with mature trees) for 10 to 20 years or more.

Listed plant species would not be affected by the water level changes because they are not presently known to occur in the USBR project area at the reservoirs. Some listed animal species would not be affected by the increase in water levels. Migrant American peregrine falcons would not be affected because no decrease in prey (ducks, shorebirds) would be expected with the gradual increase in water level. Mountain plover would not be expected to occur in the reservoir shoreline plant communities because the species prefers upland plant communities. Bell's vireo nesting habitat, if present along the shore, could be partially affected. Non-significant effects would be expected because the gradual change would allow plant communities to reestablish.

In the short term, several listed species known or suspected to occur at the reservoirs would benefit from the increase in water levels. During an average year, suitable habitat for amphibian and fish reproduction would increase with the rise in water levels. In the short term, listed amphibian/fish-eating birds (neotropic cormorant, bald eagle, and common black hawk) would potentially benefit from the increase in prey. Trees in some of the wooded shoreline plant communities would die because of the increase in water levels. Listed birds such as neotropic cormorant and bald eagle would benefit from the increase in perch sites. Migrant southwestern willow flycatchers would benefit from the increase in flooded woodland communities along or adjacent to the shoreline. In the long-term, effects to listed species would be non-significant because of the gradual change in water levels.

Caballo Reservoir operations would not change significantly during Phase 3 from the No Action Alternative (see Table 4-4.8). No long-term effects to T&E species communities would occur at this reservoir.

9-4.5.1.2 Insects

Habitat is not suitable at the reservoirs for listed insects that occur in the project area (see Table 9-2.2). Listed insects would not be affected by reservoir operations.

9-4.5.1.3 Molluscs

Habitat is not suitable at the reservoirs for listed molluscs that occur in the project area (see Table 9-2.3). Listed molluscs would not be affected by reservoir operations.

9-4.5.1.4 Amphibians and Reptiles

9-4.5.1.4.1 Phases 1, 2, and 3—Construction. Construction activities in Phases 1, 2, and 3 would not occur at the reservoirs. Listed amphibian and reptiles are not known or suspected to occur within the USBR project area at the reservoirs (USBR 1999). Short-term effects would not occur to listed amphibians and reptiles.

9-4.5.1.4.2 Phases 1, 2, and 3—Operation. Listed amphibian and reptiles are not known or suspected to occur within the USBR project area at the reservoirs. Therefore, no long-term Phase 1, 2, or 3 operational impacts to listed amphibian and reptile species would occur at the reservoirs.

9-4.5.1.5 Birds

9-4.5.1.5.1 Phases 1, 2, and 3—Construction. Construction activities in Phases 1, 2, or 3 would not occur at the reservoirs for this alternative. Short-term impacts to listed bird species would not occur.

9-4.5.1.5.2 Phase 1—Operation. Average monthly reservoir levels would change by up to 1 foot at Caballo and Elephant Butte Reservoirs during Phase 1 compared to the No Action Alternative (see Tables 3-4.3 and 3-4.4). No long-term effects to listed bird species would occur at either reservoir.

9-4.5.1.5.3 Phase 2—Operation. During Phase 2, average monthly reservoir levels would change by up to 1 foot from the No Action Alternative and from Phase 1 of the Preferred Alternative (see Tables 3-4.5 and 3-4.6). No long-term effects to listed bird species would occur at the reservoirs.

9-4.5.1.5.4 Phase 3—Operation. Reservoir operations during Phase 3 were described in detail in Section 9-4.4.5.1.1.6 and compared to Phase 2 operations and the No Action Alternative. Effects of water level changes on birds were also discussed and would not cause significant adverse effects. In some instances, such as fish-eating birds, effects could be beneficial. For these same reasons, no long-term effects to listed bird species would be expected during reservoir operations.

9-4.5.1.6 Mammals

9-4.5.1.6.1 Phases 1, 2, and 3—Construction. Construction activities in Phases 1, 2, or 3 would not occur at the reservoirs. Short-term effects to listed mammals would not occur.

9-4.5.1.6.2 Phase 1—Operation. The only listed mammal species known to occur within the USBR project area at the reservoirs is the spotted bat (see Section 9-3.8). Water level changes from Phase 1 of the No Action Alternative would be no greater than 1 foot. No effects on spotted bats are expected.

9-4.5.1.6.3 Phase 2—Operation. There would be no significant change from Phase 1 reservoir operations elevations or No Action elevations and no effects on spotted bats.

9-4.5.1.6.4 Phase 3—Operation. No long-term effects to listed mammal species would be expected during reservoir operations for the same reasons as given for plants (see Section 9-4.5.1.1) and birds (see Section 9-4.5.1.5).

9-4.5.2 River Corridor

The only construction activities associated with the river corridor would be at the diversion sites and associated conveyances (canals and/or pipelines) to the treatment plants. These impacts are discussed in the section on treatment plants (see Section 9-4.5.3). Operational changes (water flow/level changes) would occur in the Rio Grande. A large portion of the former native plant communities has been previously disturbed because of: 1) channelization of the Rio Grande, 2) the physical features of the levees and floodplain, 3) flow regime management, 4) mowing of the floodplain, 5) recreational use of the floodplain, and to a lesser extent, 6) livestock grazing.

9-4.5.2.1 Plants

9-4.5.2.1.1 Phase 1—Construction. The only short-term effects associated with the river corridor would occur at the diversion sites and associated conveyances (canals and/or pipelines) from the diversion site to the treatment plants. These effects are discussed in this chapter's section on treatment plants (see Section 9-4.5.3.1).

9-4.5.2.1.2 Phase 1—Operation. Flows within the river would increase slightly during the winter months (November–February). Phase 1 operations would not affect any listed plants in the river corridor because of the season when the flow would increase and the small increase in the flow.

9-4.5.2.1.3 Phases 2 and 3—Construction. No construction activities would occur in the river corridor in Phases 2 or 3, and no short-term effects to listed plants would occur.

9-4.5.2.1.4 Phases 2 and 3—Operation. River operations would not change significantly in Phases 2 or 3. No long-term effects to listed plants present in the river corridor would occur.

9-4.5.2.2 Insects

The only potentially occurring listed insect species, the Anthony blister beetle, has not been found in the project area since 1963. Surveys were not conducted for this insect because of the low potential of occurrence in the project area. Short-term and long-term construction and operational effects to the Anthony blister beetle would not be expected.

9-4.5.2.3 Molluscs

Listed land snails for the project area have a very low potential of occurrence because of their specific habitat requirements, and they would not be expected to occur in the river corridor. Short-term and long-term construction and operational effects to listed molluscs would not be expected.

9-4.5.2.4 Amphibians and Reptiles

9-4.5.2.4.1 Phase 1—Construction. The only short-term effects associated with the river corridor would be the construction of diversion sites and associated diversion conveyances (canals and/or pipelines) to the treatment plant. These effects are discussed in this chapter's water treatment plants section (see Section 9-4.5.3.4).

9-4.5.2.4.2 Phase 1—Operation. The only listed species found during the surveys was a Texas horned lizard (FWS species of concern). One was found in the river corridor (floodplain) near Hatch. Others would be expected to occur in the floodplain within the river corridor. The predicted increase in flow would be very small and resulting increase in lateral movement of ground water from the river into the floodplain would be negligible. Therefore, little if any change in vegetation communities is predicted because the sandy soils in the floodplain are very permeable and would not hold a sufficient quantity of water for mesic plant communities to change significantly. The magnitude of the habitat change would be minimal to the existing vegetation community. Any long-term effects to Texas horned lizards would be expected to be non-significant because of the minimal changes in habitat expected within the river corridor.

9-4.5.2.4.3 Phases 2 and 3—Construction. Construction would not occur in Phases 2 or 3. No impacts would occur to listed amphibians and reptiles.

9-4.5.2.4.4 Phases 2 and 3—Operation. Operations and potential impacts would be the same as described for Phase 1.

9-4.5.2.5 Birds

Listed species found during surveys in the river corridor include: neotropic cormorant, bald eagle, ferruginous hawk, peregrine falcon, yellow-billed cuckoo, western burrowing owl, loggerhead shrike, and Bell's vireo. Please see Section 9-3.7.2 for more information on these species.

9-4.5.2.5.1 Phase 1—Construction. The only short-term effects associated with the river corridor would occur at the diversion sites and associated conveyances (canals and/or pipelines) from the diversion site to the treatment plants. These effects are discussed in this chapter's section on treatment plants (see Section 9-4.5.3).

9-4.5.2.5.2 Phase 1—Operation. River flows would increase during the winter months (November-February) above the Upper Valley WTP and would decrease below, with implementation of the Preferred Alternative. Some sandbars (dry river bed between the bank and water) and some islands in the Rio Grande that are currently exposed would be partially or totally covered by water because of the rise in water level associated with increased flow in the upper reaches. This situation would be reversed in the lower reaches. Habitat for neotropic cormorant and wintering bald eagles would change because of the increase or decrease in water levels.

Two habitat parameters were selected to determine habitat losses and gains associated with the Preferred Alternative. The first is water less than 6 inches deep and the second is exposed bottom area. Water less than 6 inches deep was selected as a habitat parameter because a reduction in this habitat could result in a decrease of prey availability (loss of fish nursery habitat) for wintering bald eagles. The second is exposed bottom area or the total area not covered by water from bank to bank. These Rio Grande habitats are used by neotropic cormorants and wintering bald eagles for roosting.

Feeding, loafing, and roosting habitat would potentially decrease in the winter months with the increase in flow/water level. A maximum of 53 acres of water less than 6 inches deep would be lost in the river corridor with implementation of the Preferred Alternative (see Table 3-4.1). This loss is small and would not affect foraging or fish populations in the river corridor. The small loss of potential feeding habitat in the project area (7.2 percent; 53 acres lost of 732 acres available) may affect, but not likely adversely affect, neotropic cormorant and bald eagle.

Insignificant losses (less than 500 acres) in exposed sandbar and shoreline habitat would occur in the upper segment (Rincón 1 through Mesilla 2) reaches (see Table 3-4.2). In fact, exposed sandbar and shoreline habitat would increase by a maximum of 240 acres in the river corridor under the Preferred Alternative (see Table 5-4.1). Roosting sites would

increase below the Upper Valley WTP and in the lower valley. Changes in roosting habitat in the river corridor, including the increase in habitat downstream of the Upper Valley WTP, may affect, but would not likely adversely affect, bald eagles.

In summary, although some local impacts would be expected to occur in upstream areas to neotropic cormorant and bald eagle roosting habitat during winter, project area impacts would be non-significant because of the increase in downstream habitat.

9-4.5.2.5.2.1 Common black hawk/Ferruginous hawk/Western burrowing owl. As previously discussed, operations would not cause any significant impacts on prey availability. Implementation of the Preferred Alternative would not impact these species.

9-4.5.2.5.2.2 American peregrine falcon. Prey availability (waterfowl) for migratory or wintering American peregrine falcons would not change substantially in the river corridor during operations (see Chapter 6-4.5.2). Implementation of the Preferred Alternative would not have significant impacts on peregrine falcons.

9-4.5.2.5.2.3 Southwestern willow flycatcher/Yellow-billed cuckoo/Bell's vireo/loggerhead shrike. The minor increase in water flow during the winter months would potentially benefit riparian vegetation communities. The slight increase in lateral movement of water from the river to riparian communities because of higher water levels could increase the water supply to plant and insect communities. This increase in water levels from higher flows could benefit the southwestern willow flycatcher population in Selden Canyon by improving a water supply that is needed to meet nesting requirements for the species (especially in drought years). In addition, the slightly higher water levels would potentially increase prey insect populations. Although difficult to quantify because of the absence of hydrologic data for the floodplain, it is expected that only very minor beneficial impacts to the southwestern willow flycatcher population in Selden Canyon would occur because of the potential slight increase in vegetation health and insect populations. Similar very minor beneficial impacts to yellow-billed cuckoo and Bell's vireo would occur. Loggerhead shrikes would not be affected by operational flow changes.

9-4.5.2.5.3 Phases 2 and 3—Construction. Construction would not occur during Phases 2 or 3, and no short-term impacts to listed bird species would occur.

9-4.5.2.5.4 Phases 2 and 3—Operation. Minor changes in river operations would occur during Phases 2 or 3. Impacts would be similar to those previously described in Section 9-4.5.2.5.2.

9-4.5.2.6 Mammals

9-4.5.2.6.1 Phase 1—Construction. The only short-term impacts associated with the river corridor would be the construction of diversion sites and associated diversion conveyances (canals and/or pipelines) to the treatment plant. These impacts are discussed in this chapter's treatment plants section (see Section 9-4.5.3.6).

9-4.5.2.6.2 Phase 1—Operation. Habitat for federally listed (FWS endangered and threatened) mammal species is not present in the river corridor. Based on the habitat present, a wide variety of state-listed species could potentially occur in the river corridor. The minor increase in river flow and subsequent increase in lateral movement of ground water from the river into the floodplain is expected to be so low that there would be no appreciable change in vegetation. The minor increase in flow could benefit the existing plant communities to a very small degree. Any listed mammals that may occur would benefit from an increase in cover and forage.

9-4.5.2.6.3 Phases 2 and 3—Construction. Construction would not occur in Phases 2 or 3. No short-term impacts would occur to listed mammal species.

9-4.5.2.6.4 Phases 2 and 3—Operation. Operations would not change significantly from Phase 1. As previously discussed in Section 9-4.5.2.6.2, very minor beneficial impacts may occur to any listed mammals present because of potentially increased vegetation cover in the floodplain with increased water flows.

9-4.5.3 Water Treatment Plants (WTPs)

9-4.5.3.1 Plants

9-4.5.3.1.1 Phase 1—Construction. Based on the habitat present at the proposed water treatment plant (WTP) sites, federally listed plants would not occur within these locations. State-listed plant species were not found during surveys of accessible treatment plant sites (Upper Valley), and habitat for state-listed plant species is not present at the proposed construction sites at Jonathan Rogers WTP. Existing information and habitat quality were used to determine the potential for occurrence of listed plants at inaccessible sites (Hatch, Anthony, Las Cruces). The quality of habitat was poor at these sites because of the presence of agricultural land. Listed plant species would not be expected to occur at these sites. Non-significant impacts to state-listed plants would occur at the treatment plant sites.

Specific diversion site and diversion conveyance locations are unknown at this time. A total of 10 acres of land would be permanently disturbed at the diversion/conveyance sites. A *Distichis/Cynodon* grassland covers most of the area at and in the vicinity of the general site location. Habitat quality at these sites would be expected to be poor because of previous activities associated with river channelization and subsequent maintenance practices, such as mowing. Although the potential of listed plant species occurring at these sites is low, site-specific surveys would be conducted prior to construction. A survey report would be submitted to the FWS that discusses occurrence of any listed species, BMPs, and conservation if a federally listed species is located at the site.

Water transmission lines would be replaced or installed to service communities surrounding the treatment plant sites. The ROW for the transmission lines would temporarily disturb a total of approximately 245 acres of land and would be located adjacent to existing roadways. Approximately 15 acres of land would be permanently disturbed. Although some native habitat is present, the majority of the habitat present is agricultural (see Section 3-3.2.3).

Suitable habitat for listed plants is non-existent in agricultural habitat and, at best, marginal in areas of native habitat within the ROW. Listed plants would not be expected to occur in the transmission ROW. Non-significant effects to listed plants would occur in the transmission ROW.

9-4.5.3.1.2 Phase 2—Construction. Construction would be initiated at the Jonathan Rogers plant to expand its capacity from 60 mgd to 80 mgd. The site is within current treatment plant boundaries and does not contain suitable habitat for listed plant species. Construction expansion also would occur at several WTP sites in areas disturbed by construction during Phase 1. Treatment capability would be increased from 3.5 mgd to 4.5 mgd at Hatch, from 20 mgd to 27 mgd at Las Cruces, and from 4 mgd to 8 mgd at Anthony. No changes would occur at the other treatment plant sites. Short-term effects to listed plant species would not occur at the treatment plant project features.

9-4.5.3.1.3 Phase 3—Construction. Construction would occur only at the Anthony WTP (capacity increase from 4 mgd to 8 mgd) and the Las Cruces WTP (increase from 27 mgd to 34 mgd). Areas previously disturbed by construction during Phase 1 would be used. Short-term effects on listed plant species would not occur at either treatment plant.

9-4.5.3.1.4 Phases 1, 2, and 3—Operation. Listed plants are not expected to occur at any of the proposed WTPs. Therefore, no long-term operational effects to listed plants would be expected at these sites.

9-4.5.3.2 Insects

The only potentially occurring listed insect species, the Anthony blister beetle, has not been found in the project area since 1963. Surveys were not conducted for this insect because of the low potential of occurrence in the project area. Short-term and long-term construction and operational effects to the Anthony blister beetle would not be expected.

9-4.5.3.3 Molluscs

Habitat at the WTP sites is not suitable for listed molluscs to occur in the project area. Therefore, no construction-related effects would occur.

9-4.5.3.4 Amphibians and Reptiles

9-4.5.3.4.1 Phase 1—Construction. Listed amphibians and reptile species were not found during surveys of accessible WTP sites (Upper Valley). Habitat for listed amphibian and reptile species is not present within the proposed construction sites at Jonathan Rogers WTP. Existing information and habitat quality were used to determine the potential occurrence of listed amphibians and reptiles at inaccessible sites (Hatch, Anthony, Las Cruces I-10 site). The quality of habitat was poor at these sites because of the presence of agricultural land. Listed amphibian and reptiles would not be expected to occur at the WTP sites. Short-term construction effects to listed amphibian and reptile species would therefore not occur at the WTP sites.

Specific diversion site and diversion conveyance locations are unknown at this time. Habitat quality at these sites would be expected to be poor because of activities associated with river channelization and maintenance practices such as mowing. Although the potential of listed amphibian and reptile species occurring at these sites is low, site-specific surveys would be conducted prior to construction. A survey report would be submitted to the FWS. The report would discuss occurrence of any listed species, BMPs, and conservation if a listed species were located at the site.

As previously discussed, the ROW for the water transmission lines associated with the WTPs would temporarily disturb 245 acres of land and permanently disturb 15 acres of land. The majority of habitat in the ROW is agricultural. Texas horned lizard was found in disturbed habitats during surveys for this project. Some Texas horned lizards would be expected to occur in native habitats within the ROW and be impacted by construction activities. The number affected would be low because of the marginal habitat present in and adjacent to the ROW. Non-significant effects to Texas horned lizard would occur during construction activities.

9-4.5.3.4.1 Phase 2—Construction. Construction would be initiated at the Jonathan Rogers plant. The site is within current treatment plant boundaries and does not contain suitable habitat for listed amphibians and reptiles. At the remaining sites where construction would occur, areas previously disturbed by construction during Phase 1 would be used. Short-term effects on listed amphibian and reptile species would therefore not occur at the WTPs.

9-4.5.3.4.2 Phase 3—Construction. Construction expansion at the Anthony and Las Cruces WTPs would be in areas previously disturbed by construction during Phase 1. No effects on listed amphibian and reptile species would occur.

9-4.5.3.4.3 Phases 1, 2, and 3—Operation. Listed amphibian and reptiles would not be expected to occur at the treatment plant sites. Therefore, no long-term effects to listed amphibian and reptile species would occur at the WTPs.

9-4.5.3.5 Birds

9-4.5.3.5.1 Phase 1—Construction. Listed bird species were not found during reconnaissance-level surveys of inaccessible sites (Hatch, Anthony, Las Cruces I-10 site). Northern goshawk and yellow-billed cuckoo could use the Las Cruces I-10 site for feeding or roosting during migration and/or winter. Elimination of this habitat would not affect the northern goshawk or the yellow-billed cuckoo since less than 1 percent of this habitat would be eliminated from the project area by construction (66 of 26,000+ acres; see Table 5-4.3).

One western burrowing owl was found on the Upper Valley site. Initial construction at this site would be conducted from September to April to avoid direct impacts to nesting owls. Approximately 238 acres of agricultural land would be eliminated at the Upper Valley site because of the construction of the plant and the onsite water holding/storage reservoirs. The elimination of this breeding habitat for western burrowing owl would have non-significant

effects because less than 1 percent of agricultural land (238 of the 157,000+ acres; see Table 5-4.3) in the project area would be converted to municipal use.

Winter/early spring feeding habitat (fallow/graded agricultural land) for whooping crane and mountain plover is present on all WTP sites except Jonathan Rogers. Whooping cranes are considered an incidental species in the area (USDI 1991a); therefore, no species-specific surveys were conducted. No mountain plovers were found during a 4-day survey of the Rincón Valley in March 1999. Whooping cranes and mountain plovers that could occasionally use the sites for feeding would be displaced. Less than 1 percent of the potential fallow agricultural habitat would be eliminated because of construction (361 of more than 100,000 acres; see Table 5-4.3). Non-significant effects to whooping cranes and mountain plovers could occur because of the less than 1 percent loss of winter feeding habitat and the relatively low expected use of the sites by listed birds.

Specific diversion site and diversion conveyance locations are unknown at this time. A total of 10 acres of land would be permanently disturbed at the sites. *Distichilis/Cyndon* grassland is the dominant vegetation community in the general area where the diversion site and conveyance would be located. Habitat at the site has been severely disturbed by channelization and subsequent maintenance practices such as mowing. Two federal species of concern (ferruginous hawk and loggerhead shrike) use the floodplain during the winter for feeding. These species would not be affected by the small loss of potential feeding habitat (10 acres) associated with construction at these sites.

The ROW for the water transmission lines associated with the treatment plants would temporarily disturb 245 acres of land and permanently disturb 15 acres of land. The majority of this habitat is agricultural. Western burrowing owl, a federal species of concern, often uses this habitat (drainage pipes, burrows of gophers, holes in irrigation banks) to nest or roost. Although the majority of this habitat is agricultural, some suitable habitat (Chihuahuan Desert scrub [honey mesquite]) is present for loggerhead shrike, a federal species of concern). One western burrowing owl and two loggerhead shrikes were observed in similar habitats during surveys of the El Paso Aqueduct ROW. Biologists would survey suitable habitats along the transmission line ROW prior to initiation of construction to determine presence/absence of these species. If the species are nesting in the ROW, avoidance zones would be established until the young have fledged. These sites would be monitored by biologists. Based on these management measures, no significant effects would occur to listed birds in the water transmission ROW.

9-4.5.3.5.1 Phase 2—Construction. Treatment capacity would be increased at the Hatch, Anthony, Las Cruces, and Jonathan Rogers WTPs. Construction would not occur at other sites. No short-term construction effects would occur to listed bird species because the expansions would occur on land initially cleared for Phase 1.

9-4.5.3.5.2 Phase 3—Construction. The only construction scheduled would occur at the Anthony and Las Cruces WTPs, which would be expanded. No short-term construction effects to listed bird species would occur because the expansions would occur on land initially cleared for Phase 1.

9-4.5.3.5.3 Phases 1, 2, and 3—Operation. Operations would involve the use of existing equipment and facilities. Operation of WTP onsite reservoirs would potentially benefit the state-listed peregrine falcon by providing new feeding areas for the species.

9-4.5.3.6 Mammals

9-4.5.3.6.1 Phase 1—Construction. Habitat for federally listed (FWS endangered and threatened) mammal species is not present at the WTP sites. Listed mammal species were not found during reconnaissance-level surveys of accessible treatment plant sites (Upper Valley). Habitat for listed mammal species is not present within the proposed construction site at the Jonathan Rogers WTP. Existing information and habitat quality was used to determine the potential occurrence of listed mammals at inaccessible sites (Hatch, Anthony, Las Cruces I-10 site). The quality of habitat was poor at most of these sites because of the previous conversion to agricultural land. With the exception of feeding bats, none of the remaining listed mammals would be expected to occur at the WTP sites. Short-term construction effects to listed mammal species would not occur at the sites.

Specific diversion site and diversion conveyance locations are unknown at this time. Habitat quality at these sites would be expected to be poor because of activities associated with river channelization and subsequent maintenance practices, such as mowing. Although the potential of listed mammal species occurring at these sites is low, site-specific surveys would be conducted prior to construction. A survey report would be submitted to the FWS. The report would discuss occurrence of any listed mammal species, BMPs, and conservation if a listed species were located at the site.

The ROW for the water transmission lines associated with the treatment plants would temporarily disturb 245 acres of land and permanently disturb 15 acres of land. The majority of this habitat is agricultural. Suitable habitat for listed mammals is marginal in the non-agricultural habitats, and listed mammals would not be expected to occur in the ROWs. No significant effect to listed mammals would be expected during construction.

9-4.5.3.6.1 Phase 2—Construction. Construction would be initiated at the Jonathan Rogers site. This site is within current plant boundaries and does not contain suitable habitat for listed mammals. At the remaining sites where construction would occur, areas previously disturbed by construction during Phase 1 would be used. Short-term effects on listed mammal species would therefore not occur at the WTP sites.

9-4.5.3.6.2 Phase 3—Construction. Construction would occur only at the Anthony and Las Cruces WTPs. Areas previously disturbed by construction during Phase 1 would be used at both sites. Short-term effects to mammal species would therefore not occur at either WTP.

9-4.5.3.6.3 Phases 1, 2, and 3—Operation. Operations would involve the use of existing equipment and facilities. No effects to listed mammals would occur because operations would not involve any ground disturbance.

9-4.5.4 Aqueducts

9-4.5.4.1 Plants

9-4.5.4.1.1 Phase 1—Construction. A 50-foot-wide permanent easement and a 50-foot-wide temporary easement would be required during construction of the El Paso Aqueduct. This would temporarily disturb 21 acres of habitat and permanently disturb 369 acres of land. Two listed plant species were found along the El Paso Aqueduct route. Fifty to 60 sand prickly pear, a Texas species of concern, and three southwestern barrel cactus, a BLM sensitive species, were observed during surveys. Both species would be "taken" by construction activities. Conservation measures described in Section 9-4.9 would be implemented to reduce the significance of the effect. Based on the conservation measures that would be completed, no short-term effects to listed plant impacts would occur in Phase 1.

9-4.5.4.1.1 Phases 2 and 3—Construction. Construction would not occur during Phases 2 and 3, and no effects to listed plant species would occur at the aqueduct.

9-4.5.4.1.2 Phases 1, 2, and 3—Operation. Temporary long-term effects would occur during operational maintenance activities in the 50-foot-wide permanent easement. Non-significant effects would occur to listed plant species because as stated in Section 9-4.5.4.1.1, all listed plants have been transplanted out of the ROW.

9-4.5.4.2 Insects

The only potentially occurring listed insect species, the Anthony blister beetle, has not been found in the project area since 1963. Surveys were not conducted for this insect because of the low potential of occurrence in the project area. Short-term and long-term construction and operational effects to the Anthony blister beetle would not be expected.

9-4.5.4.3 Molluscs

Listed land snails for the project area have a very low potential of occurrence because of their specific habitat requirements. They would not be expected to occur along the aqueduct route since the proposed route does not cross mountain slopes. Short-term and long-term construction and operational effects to listed molluscs would not be expected.

9-4.5.4.4 Amphibians and Reptiles

9-4.5.4.4.1 Phase 1—Construction. The only listed species found during the surveys was a single Texas horned lizard in the El Paso Aqueduct ROW. Although only one was found, others are likely present because accurate surveys are difficult to conduct for this species since it is often buried in loose soil. It is estimated that several Texas horned lizards would be taken during construction activities. Non-significant effects would occur to the Texas horned lizard population because of the large area of suitable habitat present adjacent to the ROW.

9-4.5.4.4.1 Phases 2 and 3—Construction. Construction would not occur during Phases 2 or 3, and listed amphibian and reptile species would not be affected along the aqueduct.

9-4.5.4.4.2 Phases 1, 2, and 3—Operation. Operation would begin in Phase 1 and continue in Phases 2 and 3. As previously discussed, temporary long-term effects would occur during operational maintenance activities. Non-significant effects to listed amphibians/reptiles would occur because of similar abundant habitat adjacent to the ROW.

9-4.5.4.5 Birds

9-4.5.4.5.1 Phase 1—Construction. Based on the moderate quality of habitat present along the proposed El Paso Aqueduct, the potential exists that two of the species (western burrowing owl and gray vireo) would be summer residents and seven migrants or winter visitors (northern goshawk, zone-tailed hawk, peregrine falcon, Costa's hummingbird, common ground dove, Lucifer hummingbird, and Bell's vireo) could potentially occur in the ROW. Loggerhead shrike would be a permanent resident. One western burrowing owl and two loggerhead shrikes were found during ROW surveys. One western burrowing owl and one loggerhead shrike was found in the Canutillo section of the route. Biologists would survey suitable habitats along the Canutillo transmission line section of the route ROW prior to initiation of construction to determine presence or absence of these species. If the species are nesting in the ROW, avoidance zones would be established until the young have fledged. These sites would be monitored by biologists. Construction on the remainder of the aqueduct would occur during the non-breeding season (September-February) to avoid direct impacts to nesting birds. Based on these BMPs, no significant effects would occur to listed birds in the water transmission ROW. Non-significant effects would occur to these species because of similar abundant habitat adjacent to the ROW.

9-4.5.4.5.2 Phases 2 and 3—Construction. Construction would not occur during Phases 2 or 3, and listed birds would not be affected along the aqueduct.

9-4.5.4.5.3 Phases 1, 2, and 3—Operation. Operation would begin in Phase 1 and continue in Phases 2 and 3. As previously discussed, temporary long-term effects would occur during operational maintenance activities. Non-significant effects to listed birds would occur because of similar abundant habitat adjacent to the ROW.

9-4.5.4.6 Mammals

9-4.5.4.6.1 Phase 1—Construction. Based on the habitat present, federally listed endangered and threatened mammal species would not occur along the El Paso Aqueduct ROW. State-listed mammals were not found during surveys of the proposed aqueduct ROW. A wide variety of federal species of concern and state-listed mammals would potentially use the aqueduct ROW for feeding, especially bats. A total of 390 acres of agricultural, creosote scrub, mesquite scrub grassland, tamarisk, and highway scrub lands would be permanently or temporarily disturbed by construction activities. Non-significant short-term and long-term

effects would occur to listed mammals because of the large area of similar habitats adjoining the ROW.

9-4.5.4.6.2 Phases 2 or 3—Construction. Construction would not occur during Phases 2 or 3, and no additional effects on listed mammals would occur along the aqueduct.

9-4.5.4.6.3 Phases 1, 2, and 3—Operation. Operation would begin in Phase 1 and continue in Phases 2 and 3. Operational maintenance would occasionally disturb up to 84.5 acres in the permanent ROW. Non-significant effects to listed mammals would occur because of similar abundant habitat adjacent to the ROW.

9-4.5.5 Aquifer Storage and Recovery (ASR)

A separate site-specific environmental review and permitting process will be undertaken to evaluate the aquifer storage and recovery (ASR) feature once the exact locations of the wellheads and water transmission lines are finalized.

9-4.5.5.1 Plants

Field surveys will be conducted to identify effects on listed plants. The significance of any potential effect will be addressed. BMPs and Standard Operating Procedures (SOPs) will be developed to decrease the significance of any impact identified to listed plant species. If necessary, conservation measures will be developed in an attempt to reduce the level of impact below significance.

The assessment of impacts from ASR development is based on the assumption that lands disturbed during construction of ASR water transmission lines would be reclaimed to native habitat following construction. If conditions change in the future and this assumption is false, the temporary impacts identified in the following ASR discussions would be permanent. As noted, future environmental review and permitting processes would modify the assessment presented here as needed.

9-4.5.5.1.1 Phase 1—Construction. Construction activities associated with the ASR include installation of the wellhead sites and transmission pipelines. Seventy-one wellhead sites with a concrete pad and an 80-foot by 100-foot pond would be constructed on the site (0.33 acre per site). A buffer zone of 0.17 acre per site would be placed around the site, and approximately 29 miles of transmission pipelines would be installed within a 100-foot-wide ROW during the construction phase. Construction at the wellhead sites would permanently convert about 23 acres of coppice mesquite dune and creosotebush scrub habitat to municipal use. The water transmission lines would temporarily disturb 223 acres of creosotebush scrub/coppice mesquite dune habitat.

One federal and eight state-listed plant species could potentially occur in the ASR areas. Habitat quality was used to predict potential occurrence and effects. Habitat quality ranges from poor to good. It is estimated that at least one state-listed plant species would be found in this project feature area. As previously discussed, conservation would be completed if a listed species is located during the site-specific surveys.

9-4.5.5.1.2 Phases 2 and 3—Construction. Construction would not occur in Phases 2 or 3, and listed plants would not be affected.

9-4.5.5.1.3 Phases 1, 2, and 3—Operation. Operations would involve occasional maintenance and start-up flushes. Water would be treated prior to discharge to the onsite pond. Evaporation and infiltration would be rapid because of the climate and permeable soils. Listed plants, if present, would not be affected because no new ground disturbances would occur during operation.

9-4.5.5.2 Insects

The only potentially occurring listed insect species, the Anthony blister beetle, has not been found in the project area since 1963. Surveys were not conducted for this insect because of the low potential of occurrence in the project area. Short-term and long-term construction and operational effects to the Anthony blister beetle would not be expected to occur.

9-4.5.5.3 Molluscs

Suitable habitat for listed land snails is not present at the well sites, and no construction or operational effects are expected.

9-4.5.5.4 Amphibians and Reptiles

9-4.5.5.4.1 Phase 1—Construction. The listed Texas horned lizard (federal species of concern) may be present in the ASR area. This possibility would be investigated during site-specific surveys. If present, this species would probably not be significantly affected because of the large area of suitable habitat adjacent to the wellhead sites.

9-4.5.5.4.2 Phases 2 and 3—Construction. Construction would not occur after Phase 1, and no additional effects to listed amphibians and reptiles would occur.

9-4.5.5.4.3 Phases 1, 2, and 3—Operation. Operations would involve occasional maintenance and start-up flushes. Water would be treated prior to discharge to the onsite pond. Evaporation and infiltration would be rapid because of the climate and the permeable soils. No effects to Texas horned lizards would be expected.

9-4.5.5.5 Birds

9-4.5.5.5.1 Phase 1—Construction. Habitat quality was used to predict the potential occurrence of species and potential impacts. Five listed bird species potentially occur at the site (ferruginous hawk, common ground dove, Bell's vireo, loggerhead shrike, varied bunting). Loggerhead shrike would be the only species to occur regularly. Nesting shrikes could potentially be affected.

9-4.5.5.5.2 Phases 2 and 3—Construction. Construction would not occur after Phase 1. Therefore, no additional construction effects to listed birds would occur.

9-4.5.5.5.3 Phases 1, 2, and 3—Operation. As previously discussed, operations would involve maintenance and start-up flushes. Water in the ponds after the flush may provide temporary intermittent benefits to listed neotropical birds during migration. Other operational activities are not anticipated to affect birds.

9-4.5.5.6 Mammals

9-4.5.5.6.1 Phase 1—Construction. No federally listed endangered or threatened species would be expected to occur at the ASR site because of lack of suitable habitat. Habitat quality and quantity were used to predict potential occurrence of state-listed species and potential effects . Habitat is of moderate to high quality, and both categories of habitats are locally abundant. The potential exists that several state-listed mammals would be present at the site. Potential effects would be assessed after site-specific surveys. Conservation would be completed if listed species are found during the surveys. Based on these assumptions, non-significant effects would be expected to any state-listed mammals found at the site.

9-4.5.5.6.2 Phases 2 and 3—Construction. Construction would not occur after Phase 1. Short-term effects to listed mammals would not occur in Phases 2 or 3.

9-4.5.5.6.3 Phases 1, 2, and 3—Operation. As previously discussed, operations would involve maintenance and start-up flushes. The occasional water in ponds after the flush may provide intermittent and temporary benefits for listed mammals. Other operational activities are not anticipated to affect birds.

9-4.5.6 Land Conversion

Biological impacts associated with land conversion are discussed in Chapter 8, *Wildlife Habitat Value and Use*.

9-4.5.7 Impacts and Benefits Associated with Enhancement Features

9-4.5.7.1 River Corridor

Proposed enhancement features for the river corridor that would affect listed species include:

- Modifying drain/spillway to river confluence
- Widen active channel with embayments
- Plant native riparian vegetation
- Conduct tamarisk control
- Establish non-mow areas
- Levee setback at selected locations

Establishment of non-mow areas would provide immediate short-term and long-term benefits to the existing plant communities in the river corridor. In the short-term, effects associated with mowing (displacement, loss) would decrease for Texas horned lizard (a listed federal species of concern) known to occur in the river floodplain. In the long-term, some habitat for

this species would potentially decrease with the increase in vegetation cover. Habitat in the floodplain is marginal for Texas horned lizard. Non-significant effects would be expected because of the low number of individuals affected and the loss of marginal habitat. In the long-term, the increase in vegetation cover and food associated with the expected increase in vegetation from planting native riparian vegetation and not mowing would potentially provide additional prey (insects, birds, small mammals) for listed migratory and wintering birds (southwestern willow flycatcher [federal endangered], Bell's vireo [New Mexico threatened], peregrine falcons [state endangered], and ferruginous hawks [federal species of concern]).

Some listed species would potentially be affected in the short-term by construction of the enhancement features (modification of the drain/spillway confluence, building embayments, and setting back of some levees), planting of native riparian vegetation, and controlling tamarisk. An unknown number of Texas horned lizards could be lost during enhancement construction activities and/or the conversion of existing non-native habitat to native habitat in the floodplain. Non-significant effects would be expected to Texas horned lizards because of the low number of individuals expected in this marginal habitat. In the long-term, listed resident, migratory, and wintering birds (neotropic cormorant (New Mexico threatened), white-faced ibis (federal species of concern), black tern (federal species of concern), and bald eagle (new Mexico threatened) could benefit because of an increase in prey (benthic invertebrates, fish) resulting from construction of the embayments. Listed bats may also benefit because of the potential increase in prey (insects) associated with the embayments.

9-4.5.7.2 Land Conversion

Converting agricultural land to other uses in order to meet water needs would potentially benefit several listed species. Proposed enhancement features include planting with desired native species and controlling noxious weeds.

The initial conversion to M&I use would result in no significant effects (displacement, loss) to any listed species that currently use agricultural lands because of the low quality habitat and low numbers of listed species that potentially use these habitats. In the long-term, approximately 1,000 acres of converted lands would be planted with desired native species. Listed birds (mountain plover [federal candidate]), Baird's sparrow [federal species of concern]), and mammals (Botta's pocket gopher, red fox [both New Mexico species of concern]) could use these areas after a native community of plants and suitable prey were established.

9-4.5.7.3 Rio Bosque Wetlands Park

Proposed enhancement features for Rio Bosque Wetlands Park that could benefit listed species include assuring a year-round water supply to support planned wetlands and associated riparian habitat. In the long-term, listed migratory birds (such as peregrine falcon, southwestern willow flycatcher, Bell's vireo [New Mexico threatened]) would benefit from the increased prey supply (from insects to waterfowl) and cover associated with the reservoir and riparian vegetation.

9-4.5.7.4 New Diversion Sites

The proposed enhancement feature, treatment wetlands, for the new diversion sites would potentially benefit listed species. In the long-term, the treatment wetlands would provide additional although limited habitat to listed amphibians/reptiles and birds associated with aquatic habitats (white-faced ibis).

9-4.5.7.5 Existing Diversion Sites

Proposed enhancement features for existing diversion sites include NMDGF property enhancements. NMDGF owns a parcel near Mesilla that they would like to improve for wildlife, although details of their plans are not known. Funding for some portion of the improvements could be provided as an enhancement feature. Any improvement of habitat would potentially benefit listed amphibians, reptiles, migratory birds, and mammals.

9-4.5.7.6 Drains/Canals

Proposed enhancement features for the existing drains and canals, which could affect avian communities, include modifying drain maintenance to improve habitat on one side of canals or drains at selected locations. This would involve either letting existing habitat colonize the area or planting of native riparian habitat. If the existing habitat is removed, short-term effects would occur to birds that currently use the area to be enhanced. Although disturbed, the existing plant communities along the drains provide important habitat for migratory and resident birds. Enhancement would be scheduled in the non-breeding season to eliminate impacts on nesting birds. In the long-term, enhancement of riparian habitat along the canals/drains would benefit listed migratory birds.

9-4.5.8 Total Impacts

A significant negative impact for listed species was defined as a “take” of a federally listed endangered or threatened species or a BLM sensitive species on land currently or previously managed by the BLM. One federally endangered species, southwestern willow flycatcher, and one BLM sensitive species, southwestern barrel cactus, occur in the project area. Both species occur at project features that are included in all of the project alternatives. The southwestern willow flycatchers occur in the river corridor project feature. The southwestern barrel cactus is present in the El Paso Aqueduct ROW.

Southwestern willow flycatcher habitat would not be affected in the short-term because construction would not occur within or adjacent to the site. In the long-term, the increase in river flows would potentially increase plant health and prey (insects) by providing additional groundwater at the breeding site adjacent to the Rio Grande. During drought years, this would potentially provide a moderate beneficial impact for the flycatchers. Minimal indirect beneficial effects would occur to the southwestern willow flycatcher with implementation of all project alternatives (see Section 9-4.5.2.5.2.3). The southwestern barrel cactus would be avoided during construction (see Section 9-4.5.4.1.1 and 9-4.9). Southwestern barrel cactus would not be significantly affected by implementation of any project alternative. Significant

negative effects to federally listed endangered and threatened species and BLM sensitive species would not result from implementation of any project alternative.

Several federal species of concern and state listed species were also found in the project area. These include: sand prickly pear, Texas horned lizard, longfin dace, neotropic cormorant, white-faced ibis, bald eagle, ferruginous hawk, peregrine falcon, yellow-billed cuckoo, southwestern willow flycatcher, loggerhead shrike, Bell's vireo, and Botta's pocket gopher. Sand prickly pear would be transplanted and therefore, non-significant effects would occur to this listed plant (see Section 9-4.9). Significant negative effects would not occur to the remaining species because of SOPs and BMPs made for this project (see Appendices 1-A and 1-B). Some beneficial impacts would occur to several listed species (see Section 9-4.5.7).

9-4.5.9 Conservation Measures

Two conservation measures would be implemented to compensate for effects to sensitive plant species found in the El Paso Aqueduct ROW. Sand prickly pear would be transplanted to an area outside the ROW. Three southwestern barrel cactus would be avoided by monitoring construction activities.

A conservation plan would be prepared for transplanting the sand prickly pear. After the construction ROW has been flagged, biologists would visit the site, determine the number of plants potentially impacted, and develop a transplant plan. A biologist would supervise transplanting and then monitor the plants after 1 week, and 1, 3, 6, and 12 months after the transplant. A conservation report would be prepared at the conclusion of the monitoring phase.

A monitoring plan would be developed for the southwestern barrel cactus. The cacti would be flagged for avoidance with appropriate construction tape and monitored when construction was in progress at and near the site.

9-4.5.10 Unavoidable Adverse Effects

No significant unavoidable adverse effects were identified during the impact analyses for listed species.

9-4.5.11 Cumulative Effects

Several projects have been identified that will potentially occur in the time frame of this project (Table 1-1.1). An attempt was made to quantify habitats and acreages for these projects. Insufficient data were available on the projects to make these determinations. However, based on location and general knowledge of the area, it is unlikely that this alternative and the above projects would together result in significant cumulative effects to listed species in the region.

9-4.6 River with Year-Round Lower Plants Alternative

This alternative is identical to the River with Local Plants Alternative (Preferred Alternative) except that additional flow would be released at Caballo Dam and less flow would be diverted to the Upper Valley WTP in order to provide additional flow below American Dam.

Under this alternative, significant increases in flow would occur from November to February. For example, in Rincón 1 the No Action river current speeds for 50 percent exceedance flows (median condition) range from 21 cubic feet per second (cfs) in December to 186 cfs in February. The River with Year-round Lower Plants current speed would range from 333 to 506 cfs (Boyle Engineering Corporation 1999). The water would not be diverted until it reaches the lower WTPs along the river.

The large increase in flow would decrease shallow water habitats in the river by a maximum of 306 acres (see Table 5-4.6) and decrease the area of bottom exposed by a maximum of 215 acres (see Table 5-4.5).

Listed species known to occur in the river corridor include Texas horned lizard, bald eagle, ferruginous hawk, peregrine falcon, yellow-billed cuckoo, southwestern willow flycatcher, Bell's vireo, and loggerhead shrike. In comparison to the River with Local Plants Alternative, the increase in flow may indirectly increase insect populations and provide better plant health because additional water would flow laterally underground into the floodplain. Although minimal, some additional benefit would occur to some of the listed avian species that use terrestrial habitats (ferruginous hawk, yellow-billed cuckoo, southwestern willow flycatcher, Bell's vireo, loggerhead shrike).

Prey availability would potentially decrease for listed cormorants (neotropic cormorant) and raptors (bald eagle) that utilize fish or waterfowl as prey because of the decrease in shallow nursery area and waterfowl feeding area from the increase in flow. In addition, some roosting habitat would be lost as the water level would flood some of the islands and sandbars. Although some local effects could occur to these listed birds the loss of habitat is not significant when the entire project area is analyzed.

9-4.7 River with Combined Plant Alternative

This alternative is identical to the River with Local Plants Alternative (Preferred Alternative), except that the Anthony WTP would not be constructed. Effects associated with the construction and operation of the Anthony WTP would not occur in this alternative.

Minor changes in river flow would occur with the implementation of this alternative. Flow changes during Phase 1, as expressed in water less than 6 inches deep and monthly bottom area exposed, would be most similar to the River with Year-Round Lower Plants Alternative (see Tables 5-4.8 and 5-4.9). The only exception is that roosting habitat would increase under this alternative. Minor insignificant changes would occur in river flow for Phase 2 and Phase 3 (Boyle Engineering Corporation 1999). During Phase 2 and Phase 3, exposed bottom area would be similar to Phase 1. Non-significant effects would occur to listed species because the habitat loss would not reach significant negative levels.

9-4.8 Aqueduct with Local Plants Alternative

This alternative is similar to the River with Local Plants Alternative except that a regulating reservoir and aqueduct would be built to convey water to the Anthony and Upper Valley WTPs rather than diverting water from the river at the WTP sites. In addition, the Las Cruces Area WTP would be constructed at the Leasburg site rather than at the I-10 site.

Minor changes in river flow would occur with the implementation of this alternative. Flow changes for Phase 1, expressed in water less than 6 inches deep and monthly bottom area exposed are presented in Tables 5-4.11 and 5-4.12. Minor insignificant changes would occur in river flow for Phase 2 and Phase 3 (Boyle Engineering Corporation 1999). Although the change would be slightly greater with this alternative, non-significant effects would occur to listed species because the habitat loss would not reach significant negative levels.

9-4.8.1 Westside Regulating Reservoir

9-4.8.1.1 Plants

9-4.8.1.1.1 Phase 1—Construction. Habitat for federally listed plants is not present at the reservoir site. State-listed plant species were not observed during surveys conducted at the Westside Regulating Reservoir. The potential exists that some state-listed species could occur at the site because of the moderate quality habitat present. Any take of a state-listed plant(s) would not significantly affect populations or result in federal listing because of the small area (29 acres) affected by construction. Low numbers of individuals would be expected because of the small size of the site. Non-significant short-term effects to state-listed plants could occur at the Westside Regulating Reservoir.

9-4.8.1.1.2 Phases 2 and 3—Construction. Construction would not occur during Phases 2 or 3. No additional effects to listed plant species would occur at the site.

9-4.8.1.1.3 Phases 1, 2, and 3—Operation. Operations would involve the use of existing equipment and facilities. No significant long-term effects would occur to listed state plants because operations would not involve any new ground disturbance.

9-4.8.1.2 Insects

The only potentially occurring listed insect species, the Anthony blister beetle, has not been found in the project area since 1963. Surveys were not conducted for this insect because of the low potential of occurrence in the project area. No short-term or long-term construction and operational effects to the Anthony blister beetle would be expected to occur.

9-4.8.1.3 Molluscs

Listed land snails for the project area have a very low potential of occurrence because of their specific habitat requirements and would not be expected to occur at the reservoir or any of

the other project feature sites. Short-term and long-term construction and operational effects would not be expected to occur to listed molluscs.

9-4.8.1.4 Amphibians and Reptiles

9-4.8.1.4.1 Phase 1—Construction. Listed amphibian and reptile species were not observed during surveys conducted at the reservoir site. Based on the quality of habitat present, only one of three potentially occurring amphibians and reptiles, the Texas horned lizard, has a moderate chance of occurring at the site. The number of Texas horned lizards that potentially could occur on the site would be low because of the small area (29 acres) to be used for the reservoir. Non-significant effects to Texas horned lizard would occur during construction because of the small area affected and the low number of individuals expected to occur in the area affected by construction.

9-4.8.1.4.2 Phases 2 and 3—Construction. Construction would not occur during Phases 2 or 3. No additional construction effects to listed amphibian and reptile species would occur at the reservoir.

9-4.8.1.4.3 Phases 1, 2, and 3—Operation. Operations would involve the use of existing equipment and facilities. There would be no additional ground disturbance and no additional effects to listed amphibian and reptile species.

9-4.8.1.5 Birds

9-4.8.1.5.1 Phase 1—Construction. Listed avian species were not observed during surveys conducted at the Westside Regulating Reservoir. Based on the quality of habitat present, eight listed birds could occur as migrants at the site. The loss of 29 acres of migratory habitat is not critical to survival of these migrants because similar, although limited, habitat is present at another location in the project area (Selden Canyon).

9-4.8.1.5.2 Phases 2 and 3—Construction. Construction would not occur during Phases 2 or 3. No additional short-term construction effects on listed birds would occur at the site.

9-4.8.1.5.3 Phases 1, 2, and 3—Operation. Operations at the reservoir would involve the use of existing equipment and facilities. Migratory and wintering waterfowl at the reservoir would provide an additional foraging opportunity for migrant American peregrine falcons. This would be a potential benefit to this state-listed bird.

9-4.8.1.6 Mammals

9-4.8.1.6.1 Phase 1—Construction. Listed mammal species were not observed during surveys conducted at the Westside Regulating Reservoir. Based on the quality of habitat present, several species of concern and/or sensitive mammal species (bats/skunks) could use the site for feeding. Non-significant effects would be expected to occur on to listed mammals that may use the site because of the site's isolated location and small size.

9-4.8.1.6.2 Phases 2 and 3—Construction. Construction would not occur during Phases 2 or 3. Listed mammals that may use the site would not be affected.

9-4.8.1.6.3 Phases 1, 2, and 3—Operation. Operations at the reservoir would involve the use of existing equipment and facilities. Listed mammals that may use the site would not be affected.

9-4.8.2 New Mexico–Texas Aqueduct

9-4.8.2.1 Plants

9-4.8.2.1.1 Phase 1—Construction. Federally listed plant species were not found during the survey of the proposed New Mexico–Texas Aqueduct ROW. Habitat quality and quantity were poor along the proposed route because of the presence of agricultural lands and non-native habitat. State-listed plants would not be expected to occur within the ROW because of the highly disturbed nature of the habitat.

9-4.8.2.1.2 Phases 2 and 3—Construction. Construction would not occur during Phases 2 or 3. No short-term effects to listed plant species would occur within the ROW.

9-4.8.2.1.3 Phases 1, 2, and 3—Operation. Operation of the aqueduct would not result in any new ground disturbances or long-term effects to listed plant species.

9-4.8.2.2 Insects

The only potentially occurring listed insect species, the Anthony blister beetle, has not been found in the project area since 1963. Surveys were not conducted for this insect because of the low potential of occurrence in the project area. Short-term and long-term construction and operational effect to the Anthony blister beetle would not be expected.

9-4.8.2.3 Molluscs

Listed land snails for the project area have a very low potential of occurrence because of their specific habitat requirements. They would not be expected to occur along the aqueduct ROW since the proposed route does not cross mountain slopes. Short-term and long-term construction and operational effects would not be expected to occur to listed molluscs.

9-4.8.2.4 Amphibians and Reptiles

9-4.8.2.4.1 Phase 1—Construction. Listed amphibian and reptile species were not found during surveys of the ROW. Although less likely because of the abundance of disturbed habitat within the ROW, Texas horned lizards potentially occur along the New Mexico–Texas Aqueduct ROW. Several Texas horned lizards may be taken during construction activities. Non-significant effects would occur to the Texas horned lizard population because the number of potentially affected individuals would be low due to the lack of nearby suitable native habitat.

9-4.8.2.4.2 Phases 2 and 3—Construction. Construction would not occur during Phases 2 or 3. No short-term effects on listed amphibians and reptiles would occur within the ROW.

9-4.8.2.4.3 Phases 1, 2, and 3—Operation. Operation of the aqueduct would not be expected to result in any new ground disturbances. Temporary short-term effects could occur if maintenance is required. These ground disturbances would be infrequent and would not impact amphibians or reptiles because of the low number of individuals expected in the ROW and nearby habitats. Non-significant short-term effects to listed amphibians and reptiles would occur in Phase 2.

9-4.8.2.5 Birds

9-4.8.2.5.1 Phase 1—Construction. Listed bird species were not observed during the surveys conducted within the proposed New Mexico–Texas Aqueduct ROW. Based on the quality of habitat present, the potential exists that two of the listed species (western burrowing owl and loggerhead shrike) would be summer residents and five would be migrants or winter visitors (northern goshawk, ferruginous hawk, whooping crane, mountain plover, and common ground dove). Non-significant effects would occur to these species because of the abundance of other agricultural habitat in the project area (ferruginous hawk, whooping crane, mountain plover, common ground dove—fallow fields in winter, spring) and small areas of semi-native habitat (northern goshawk—pecan orchard) that would be temporarily disturbed during the construction.

9-4.8.2.5.2 Phases 2 and 3—Construction. Construction would not occur during Phases 2 or 3. No short-term effects on listed birds would occur along the aqueduct ROW.

9-4.8.2.5.3 Phases 1, 2, and 3—Operation. Operation of the aqueduct would not be expected to result in any new ground disturbances. If necessary, habitat may be disturbed because of maintenance activities. Birds would not be significantly affected (because of the poor quality of habitat within and adjacent to the ROW). No long-term effects to listed birds would occur in Phase 1.

9-4.8.2.6 Mammals

9-4.8.2.6.1 Phase 1—Construction. Based on the habitat present, federally listed endangered and threatened mammal species would not occur along the proposed New Mexico–Texas Aqueduct ROW. Three state-listed mammal species potentially occur in the ROW. State-listed mammals were not found during the ROW survey. Most of the ROW is agricultural habitat. Non-significant effects could occur to listed mammals because of the lack of suitable habitat and resulting low potential numbers of species and individuals.

9-4.8.2.6.2 Phases 2 and 3—Construction. Construction would not occur during Phases 2 or 3. No short-term effects on listed mammals would occur within the ROW.

9-4.8.2.6.3 Phases 1, 2, and 3—Operation. Operation of the aqueduct would not result in any new significant ground disturbances, only temporary disturbances during maintenance. No long-term effects to listed mammals would occur in Phases 2 or 3 because of the poor quality of habitat within and adjacent to the ROW.

9-4.8.3 Leasburg Site Treatment Plant

9-4.8.3.1 Plants

9-4.8.3.1.1 Phase 1—Construction. Suitable habitat is not present on the site or in the water transmission line ROW for federally listed endangered or threatened plants. The occurrence or absence of Wright's globemallow and long-stemmed flame flower, both state-listed flowers, could not be determined at the treatment plant site because this project feature was added in October and surveyed in November when both species would not be detectable. Flowering season surveys would be conducted for both species after the preliminary design plans are available for the site. If found, an attempt would be made to avoid the species during the final design of the plant. Transplantation would be considered if avoidance is not possible. If the plants are present and cannot be avoided, non-significant effects would occur because the plants are not federally listed species.

Construction would potentially eliminate eight southwestern barrel cactus, a BLM listed species, on the treatment plant site. However, this species is not listed by the state and the state currently owns the land on which the treatment plant would be constructed. An attempt would be made to avoid the plants during the preliminary design phase. Non-significant effects to southwestern barrel cactus would occur if the plants can not be avoided because these species are not listed by the state.

9-4.8.3.1.2 Phases 2 and 3—Construction. Capacity of the plant would remain the same as in Phase 1. No additional short-term effects to listed plants would occur because construction would not occur on the site.

9-4.8.3.1.3 Phases 1, 2, and 3—Operations. No long-term negative effects to listed plants would occur at the site because operations would not involve the disturbance of additional habitat on or adjacent to the site.

9-4.8.3.2 Insects

The potential occurrence of the Anthony blister beetle is very remote since the species has not been reported in the project area since 1963. No significant effect is expected to occur to this listed insect.

9-4.8.3.3 Molluscs

Habitat is not present for listed molluscs at the treatment plant site or in the water transmission line ROW. No construction or operational effects would occur to listed molluscs in the project area.

9-4.8.3.4 Amphibians and Reptiles

9-4.8.3.4.1 Phase 1—Construction. Three state-listed reptiles—Texas horned lizard, Texas lyre snake, and little white whiptail—potentially occur on this state-owned property. The occurrence or absence of these species could not be determined at the treatment plant site because this project feature was added in October and surveyed in November when the species would not be detectable. Surveys would be conducted for these species when the preliminary site plans are available. The site would be surveyed in summer, when the species are active, to determine presence or absence on the site. If present, an attempt would be made to avoid the species during the final design of the plant. If one or more of the species are present and cannot be avoided, non-significant effects would occur because these reptiles are not federally listed species.

Texas horned lizards could occur in honey mesquite habitat within the Westside water transmission line ROW. The number of Texas horned lizard would be low because of the presence of marginal, disturbed habitat. Non-significant effects to Texas horned lizards would occur during construction because of the low number of individuals expected in this marginal habitat.

9-4.8.3.4.2 Phases 1, 2, and 3—Operations. No long-term negative effects to listed amphibians and reptiles would occur at the site because operations would not involve the disturbance of additional habitat on or adjacent to the site.

9-4.8.3.4.3 Phases 2 and 3—Construction. Capacity of the plant would remain the same as in Phase 1. No additional short-term effects to listed amphibians and reptiles would occur because construction would not occur on the site.

9-4.8.3.5 Birds

9-4.8.3.5.1 Phase 1—Construction. The permanent disturbance of 66 acres of Chihuahuan Desert scrub would displace the single loggerhead shrike (federal species of concern) found on the site to similar habitat adjacent to the site. Non-significant impacts would occur to this species because of the small area of habitat impacted and the abundance of similar habitat in the project area. The presence or absence of a Bell's vireo is unknown because the site was not added as a project feature until after the conclusion of the species-breeding season. Surveys would be conducted for this species when the preliminary site plans are available. The site would be surveyed in summer, when the species would be nesting, to determine presence or absence on the site. If present, an attempt would be made to avoid the species during the final design of the plant.

Two listed species, western burrowing owl and loggerhead shrike, could occur in the water transmission line ROW. In order to avoid nesting season impacts to these species, construction would be scheduled during the non-breeding season (September to March; see Appendix A-2). Non-significant effects would occur to western burrowing owl and loggerhead shrike.

9-4.8.3.5.2 Phases 1, 2, and 3—Operations. No long-term negative effects to listed birds would occur at the site because operations would not involve the disturbance of additional habitat on or adjacent to the site. Operations at the water reservoirs would provide feeding and roosting habitat for ducks, and potentially benefit listed predatory birds (peregrine falcon, bald eagle) by providing feeding and roosting habitat.

9-4.8.3.5.3 Phases 2 and 3—Construction. Capacity of the plant would remain the same as in Phase 1. No additional short-term effects to listed birds would occur because construction would not occur on the site.

9-4.8.3.6 Mammals

9-4.8.3.6.1 Phase 1—Construction. If Botta's pocket gopher was present on the site, the permanent disturbance of 66 acres of Chihuahuan Desert scrub would impact the species. The presence or absence of Botta's pocket gopher is unknown because the project feature was added late in the season when activity of the species would be low. Surveys would be conducted for this species when the preliminary site plans are available. A survey for this species would be conducted during the summer when the species is active and above ground-level more often. If present, an attempt would be made to avoid the species during the final design of the plant.

9-4.8.3.6.2 Phases 1, 2, and 3—Operations. No long-term negative effects to listed mammals would occur at the site because operations would not involve the disturbance of additional habitat on or adjacent to the site. Operations at the water reservoirs would provide new habitat for aquatic insects and lights that would attract terrestrial insects. The insects would potentially provide a new feeding area for insectivorous listed bats.

9-4.8.3.6.3 Phases 2 and 3—Construction. Capacity of the plant would remain the same as in Phase 1. No additional short-term effects to listed mammals would occur because construction would not occur on the site.

9-4.9 Aqueduct with Combined Plant Alternative

This alternative is identical to the Aqueduct with Local Plants Alternative, except that the Anthony WTP would not be constructed. Impacts associated with the construction and operation of the Anthony WTP would not occur in this alternative. Water flows would be identical to the Aqueduct with Local Plants Alternative (see Tables 5-4.11 and 5-4.12).